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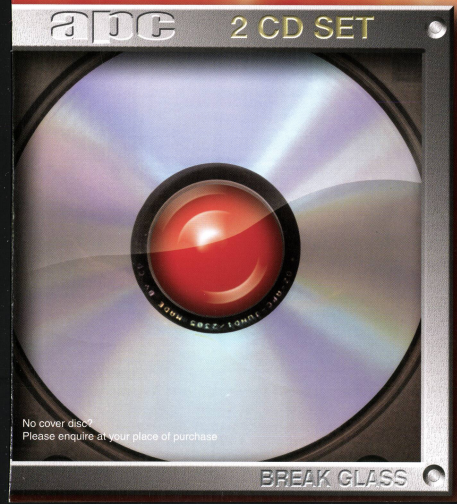
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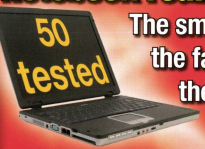
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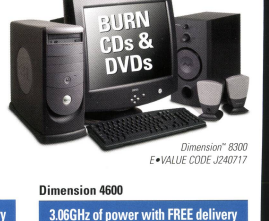
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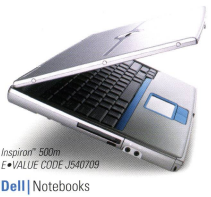
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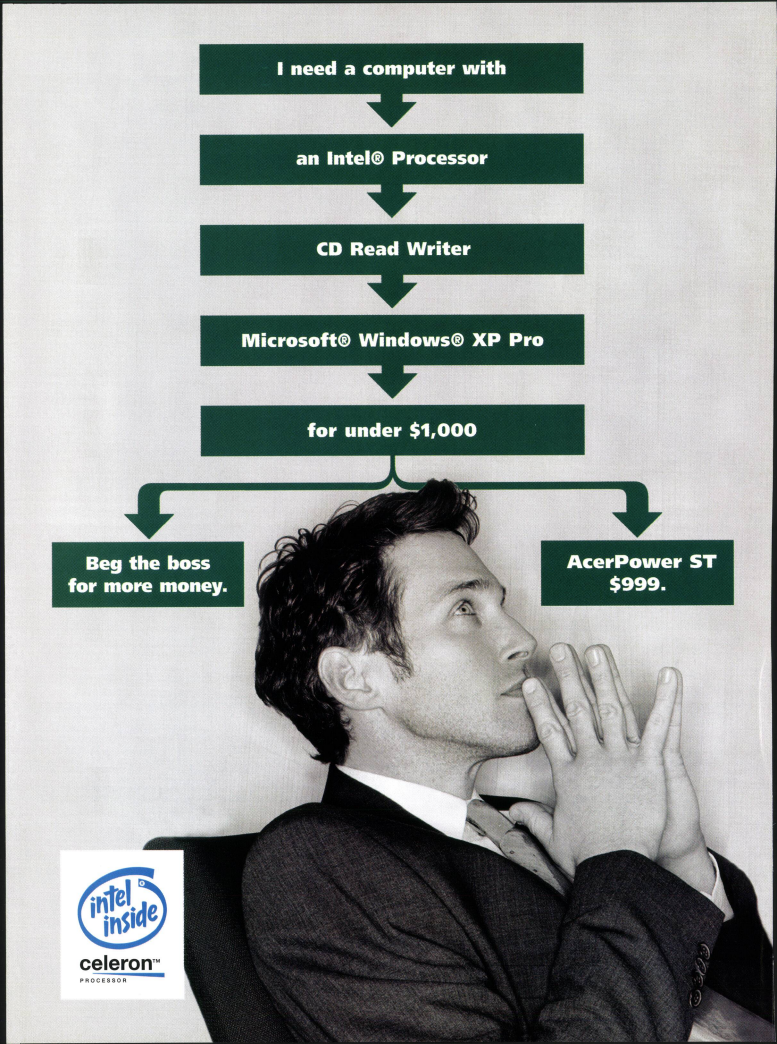
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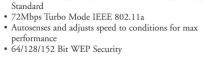
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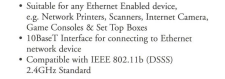
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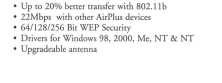
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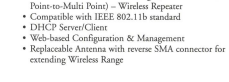
22Mbps Wireless Access Point

- Compatible with IEEE 802.11b (DSSS) 2.4GHz Standard. Up to 20% better transfer
- 22Mbps with other AirPlus devices
- 64/128/256 Bit WEP Security
- Built-in DHCP Server
- Configuration and Management via Web Browser
- External 2.5db Antenna with Reverse SMA Connector



11/54Mbps Dualband Wireless Access Point

- Compliant with IEEE 802.11a (5GHz) and IEEE 802.11b (2.4GHz) Standard
- 10/100Mbps Fast Ethernet port for connecting to Wired Network
- Autosenses and adjusts speed to conditions for max performance
- 64/128/152 Bit WEP Security



22Mbps Wireless LAN Indoor AP/Bridge

- Ethernet to 22Mbps Wireless LAN Access Point or Bridge
- Modes of Operation(s): Access Point, AP Client, Bridge (Point-to-Point or Point-to-Multi Point)
- Advanced Enterprise Functions: DCS (Dynamic Channel Selection), AP Group, AP Load Balancing, AP Backup
- Wireless Repeater Operation Function
- Additional LAN Port for AP Backup Function
- Compatible with IEEE 802.11b (DSSS) 2.4GHz Standard
- DHCP Server/Client
- Web-based Configuration & Management
- Replaceable Antenna with reverse SMA connector for extending Wireless Range

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USB/Ethernet Combo ADSL Modem

- Connect single or multiple PC's via USB or Ethernet
- 10BaseT LAN interface – USB 1.1 interface
- Supports G.dmt and G.lite
- Built-in PPPoE and PPPoA Clients
- Ethernet Bridge Mode
- Configuration & Management via Web Browser
- Telstra Approved



22Mbps Wireless ADSL Modem/Router/Switch/ Access Point

- Connects single or multiple PC's on an Ethernet or Wireless LAN to ADSL
- Built-in 22Mbps Access Point, Router, 10/100Mbps 4 Port Switch, ADSL Modem
- Supports IP Routing, NAT, DHCP
- Configuration & Management via Web Browser, Telnet
- Telstra Approved



i2eye™ Broadband Video Phone

- Standalone Video Conference Operation (No PC Required)
- 10/100Mbps Fast Ethernet Port for LAN or Broadband Connection
- Video & Audio Out for Television Connection
- Streaming Video at up to 30 Frames/Second
- Adjustable Tilt & Focus Lens
- Built-in Micophone



22Mbps Wireless IP Router for DSL/Cable Modems with 4-Port 10/100Mbps Switch

- 22Mbps Wireless LAN Access Point
- Compatible with IEEE 802.11b (DSSS) 2.4GHz Standard
- 64/128/256 Bit Wired Equivalent Privacy (WEP) Security Support
- 10Mbps WAN Port for DSL/Cable Modem
- Support NAT for single IP Address & Firewall Protection
- Supports DHCP, VPN, PPP, PAP/CHAP Security
- Advanced Firewall Features
- Configuration & Management via Web Browser



22Mbps Wireless IP Router for DSL/Cable Modems with Switch and Print Server

- 22Mbps Wireless LAN Access Point
- Compatible with IEEE 802.11b 2.4GHz Standards
- Built-in 4 Port 10/100Mbps Switch, Single Parallel Printer Port
- Supports NAT, DHCP, PPP, VPN, PAP/CHAP Security
- DMZ selectable Port
- Advanced Firewall Features
- Configuration & Management via Web Browser



IP Router for DSL/Cable Modems with 4-Port Switch & Single Port Print Server

- 10Mbps Ethernet Port for DSL or Cable Modem connection
- 4-Port 10/100Mbps Switch
- Auto-Negotiation of MDI-II/MDI-X Cross Over for Easy Expansion
- Signal Parallel Port Print Server
- Support NAT for single IP address & Firewall Protection
- Supports DHCP, VPN, PPP, PAP/CHAP Security
- Built-in Telstra BigPond client



Ethernet ADSL Modem

- Connect single or multiple PC's on an Ethernet LAN to an ADSL service
- 10BaseT Interface (RJ45)
- ADSL Interface (RJ11)
- Support G.dmt and G.lite
- PPPoE (RFC 2516) & PPPoA (RFC 2364)
- Ethernet Bridge Mode (RCF 1483)
- Built-in PPPoE Client
- Configuration and Management via Web Browser
- Telstra Approved



VPN Router for DSL/Cable Modems with 4-Port Switch

- 10Mbps Ethernet Port for DSL or Cable Modem connection
- 4-Port 10/100Mbps Switch
- RS232 Serial Port for backup Analog Modem
- Internal DMZ (Demilitarised Zone)
- LAN-to-LAN VPN Connection (8 Tunnels Supported)
- Stateful Packet inspection (SPI)
- NAT for single IP Address



IP Router for DSL/Cable Modems with 7-Port Switch & Single Port Print Server

- 10Mbps Ethernet Port for DSL or Cable Modem connection
- 7-Port 10/100Mbps Switch
- Auto-Negotiation of MDI-II/MDI-X Cross Over for Easy Expansion
- Signal Parallel Port Print Server
- Support NAT for single IP address & Firewall Protection
- Supports DHCP, VPN, PPP, PAP/CHAP Security
- Admin via Windows based program, Teinet or Web Browser
- Built-in Telstra BigPond client



Ethernet ADSL Modem

- Connect single or multiple PC's on an Ethernet LAN to an ADSL service
- 10BaseT Interface (RJ45), ADSL Interface (RJ11)
- Support G.dmt and G.lite
- PPPoE (RFC 2516) & PPPoA (RFC 2364)
- Ethernet Bridge Mode (RCF 1483)
- Built-in PPPoE Client
- Configuration and Management via Web Browser
- Telstra Approved



Network Secure Firewall with Point-to-Point VPN

- True Firewall suitable for Home or Small Office LAN
- 2 x 10/100Mbps Fast Ethernet Ports for: External LAN Connection (i.e. ADSL or Cable Modem), Internal Connection
- Internal DMZ (Demilitarised Zone)
- LAN to LAN VPN–Stateful Packet Inspection – NAT/DHCP

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INTEL® CENTRINO™ MOBILE TECHNOLOGY: *Intel® Pentium® M Processor 900MHz; Intel® PRO/Wireless Network Connection 802.11b; Intel® 855M Chipset Family/40GB HDD/256MB RAM/12.1" TFT Poly-Silicon screen/Trident XP4™ m32 graphics controller/SD Media slot/Lithium-Ion Polymer battery/6.5 hours battery life with bundled second battery (may vary depending on configuration, applications, power management settings and features utilised).*

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http://www.microsoft.com/piracy/howtotell

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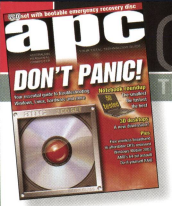
OBSERVATION: Highly mobile executives face a dilemma every time they take off. They want to travel light. But they don't want to leave anything behind.

OBJECTIVE: Build a state-of-the-art notebook around the new Intel® Centrino™ mobile technology. Pack the productivity tools they need into the lightest possible package.

RESULT: The Portégé R100 you see floating in mid air-pocket. It weighs just 1.1kg. And it's only 19mm thin at its thickest point. This was made possible by three world-leading Toshiba technologies: the new polysilicon screens (thin, bright, reliable), the new Lithium-Ion Polymer batteries (thin, light, powerful) and the new 8mm hard-disk (thin, thin). Finally, the Portégé R100's streamlined magnesium-alloy case also contains the new Intel® Centrino™ mobile technology chipset with built-in wireless capability. Consequently, it's ideal for those who want to be well equipped and well connected, without being weighed down or tied down.

ACTION: See your nearest Toshiba Authorised Reseller, visit www.isd.toshiba.com.au or call 13 30 70 for more information.

TOSHIBA



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3D desktops

From OS interfaces to monitors, a new dimension of computing is on the way.

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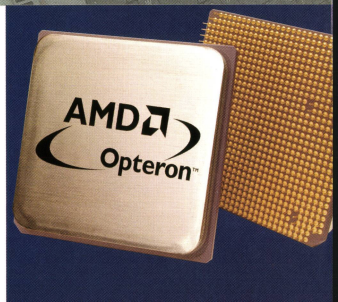
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Do-it-yourself RAID 130
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Image management

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Build your own RAID

Make your storage subsystem fly with RAID.

Password protect a Web site

Add a members-only area to your Web site.

PowerQuest Drive Image

Safeguard your system with Drive Image 5.

3D modelling with Blender

Getting started with NaN's free 3D modelling app.

Personalised XML Smart Tags

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Web graphics with CSS

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Produce graphic, Mac-style buttons on a single layer.

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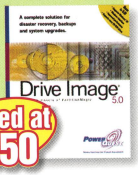
CD Contents



Drive Image 5.0

Full version

It's the smartest way to back up your system and recover from a disk crash or a total PC meltdown. Drive Image 5.0 takes a snapshot of your hard drive or individual partitions under Windows 9x, Me, 2000 and XP. If trouble strikes, use the boot disks and roll back to your most recent snapshot.



Valued at $150

Recover My Files

Full version

Retrieve data that's been lost by accidental (or deliberate) deletion. You'll be amazed at what data can be restored using Recover My Files, and there's no expert skill required on your part.



Valued at $90

When you see this CD icon in APC, it means there's bonus software on the cover CD set.

4DiskClean Lite 3.0

Full Version

Get rid of all those obselete and temporary files cluttering up your hard drive. This is the full version of 4DiskClean Lite, although it says "Shareware" under the Help menu.

Valued at $27

Image management

Finally, you can get your virtual shoebox of digital photos and scanned snaps in order with one of the image management apps tested in this month's Labs Challenge. Try out their sorting, searching and editing capabilities before you buy.

Free full game

This fantastic mission pack for Return to Castle Wolfenstein: Enemy Territory is a must-play. You don't even need the original game — just a few friends, the number of your takeaway pizza parlour and the desire to unleash multiplayer mayhem on those Nazis.

Full CD index

CD 1

Full versions

- **Active Backup Expert 1.8 Standard Edition,** also Active Backup Expert 1.8 Professional Edition trial version, special offer
- **PowerQuest Drive Image 5.0,** also PowerQuest Drive Image 7.0 trial version,special offer, Microsoft .NET Framework 1.1
- **trueSpace upgrade offer**

Emergency troubleshooting

Handhelds

- AutoDigi
- BackupBuddy
- Botzam Backup
- CardBackup
- FolderSize (21-day trial)
- JackFlash
- Pocket Backup Plus 2.1.1 (10-day trial)
- Resco Explorer 2003 4.20 (14-day trial)
- Storage Tools 1.5
- VBRegFix 2.2

Hard drives

- BadCopy Pro 3.70
- Data Rescue 10.2.1
- File Scavenger 2.1
- GetDataBack 2.0
- R-Studio
- Stellar Phoenix
- VirtualLab 3.0.6

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- RaWritewin 0.7

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- Borland JBuilder 9 Personal

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- PowerQuest Drive Image 7.0

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- Blender 2.27
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- glass drawing guide.blend
- glass.blend
- Out of Memory
- Person animated.avi
- Person animated.blend
- person.blend
- table.blend

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- "Absolute Style" Web Tutorial

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- Aqua Pill.psd
- Aqua Styles.asl
- Grain Surgery
- iCorrect EditLab 4.0
- Splat!

PHP

- Apache 2.0.46 - Mac OS X
- Apache 2.0.46 - Linux
- Apache 2.0.46 - Windows
- MySQL 4.0.13 - Mac OS X
- MySQL 4.0.13 - Linux
- MySQL 4.0.13 - Windows
- PHP 4.3.2 - Mac OS X
- PHP 4.3.2 - Linux
- PHP 4.3.2 - Windows

Python

- dict.txt
- Python 2.2.3
- target.py

Windows

- BackRex Expert Backup 2.3
- IsoBuster 1.4
- WinDriversBackup 1.0
- XP Anti-Spy 3.71

Wireless

- MiniStumbler 0.3.23
- NetStumbler 0.3.30

XML

- xml.zip

Toolkit

Linux

- Adobe Acrobat Reader 5.0.7
- cdrtools 2.00.3
- Firestarter 0.9.2

Invisible Secrets 2.1

Full version

Hide information in a JPEG image or other file with the amazing encryption technology of Invisible Secrets. Your data will be safe from prying eyes.

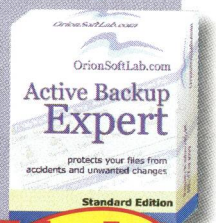


Valued at $50

Active Backup Expert Standard 1.8

Full version

Don't risk losing your most important files. Active Backup Expert is the point-and-click way to back up your files with ZIP compression.

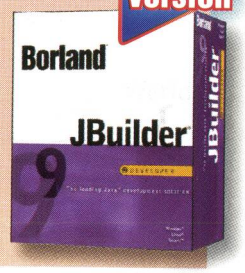


Valued at $30

JBuilder 9 Personal

Full version

Build Java applications using the very latest 9.0 release version of this extremely popular Java development environment. See page 49 for the On Test review.



Emergency troubleshooting

In trouble? We have the tools to help! To go with this month's cover feature (turn to page 98), our CDs are packed with the must-have recovery software for Windows, Linux and even Palm and Pocket PC handhelds.

Bootable recovery CD

Okay, so things are worse than you thought. Never fear, *APC* is here, and so is our bonus recovery CD. This will boot your PC back to life and let you run a selection of FreeDOS system and disk utilities to help set things straight.

Clean install tookit

If you must do a complete clean install, we've gathered 200MB of essential downloads for Windows, Linux and Macs to save you online time and cost. And see *APC's* December 2002 CD set for Microsoft's Windows 2000 and XP service packs.

- Gaim 0.64
- gFTP 2.0.14
- GIMP 1.2.5
- Linux Kernel 2.4.21
- MPlayer 0.90
- RAR for Linux 3.2
- RealPlayer 8.0
- WebMin 1.090
- Wine 20030618
- XMMS 1.2.7

Mac OS

- Adobe Reader 6.0
- Authoxy 1.2
- BBEdit Lite 6.1.2
- Carbon Copy Cloner 2.2
- Chicken of the VNC 1.3.6
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- DragThing 4.6.1
- Graphic Converter 4.6.1
- iGetter X 1.9
- Launchbar 3.2.11
- Microsoft Remote Desktop Connection 1.0.1
- PDF Browser Plugin 1.2
- Proteus 3.0
- PTHClock 2.3.1
- PTHiTunesNotifier 2.4.1
- RBrowserLite 3.1.2
- RealOne Player 9.0
- StuffIt Standard Edition X 7.03
- Tinkertool 2.3.2
- VLC Media Player 0.6.0

Windows

- Adobe Reader 6.0
- Ad-aware Standard 6.0
- DirectX 9.0 runtime
- DivX Video 5.0.5
- ICQ Pro 2003a Beta Build #3800
- PowerPoint Viewer 97
- RealOne Free Player 2.0
- Spybot - Search & Destroy 1.2
- Winamp 3 Full
- Windows Media Player 9
- WinZip 8.1 SR1
- WS_FTP LE 5.08
- ZoneAlarm 3.7.193

CD 2

Full versions

- **4DiskClean Lite 3.0** also 4DiskClean Gold 4.0 trial version
- **Invisible Secrets 2.1** also Invisible Secrets 4.0 trial version, special offer
- **Recover My Files Version 1** also Recover My Files Version 2 trial version, upgrade offer

On Test

Labs Challenge — Image management

- ACDSee 5.0.1
- Adobe Photoshop Album Starter Edition
- Imatch 3.3.0.1
- Jasc Paintshop Photo Album 4
- SmartDraw Photo
- Virtual Album

Techlife

PC Games

- Return to Castle Wolfenstein: Enemy Territory full game

Browsers

- Microsoft Internet Explorer 5.1.6 for Mac OS
- Microsoft Internet Explorer 6.0 SP1
- Mozilla 1.3.1
- Safari 1.0

Need help?

- While we've taken all care in selecting the software and testing the discs, *APC* cannot accept responsibility or liability.
- *APC* does not provide support for programs included on the discs.
- With technical problems
  Email: cd@apcmag.com
  Web: www.apcmag.com/cd
  Phone: (02) 9288 9111

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YOUR TOTAL TECHNOLOGY GUIDE

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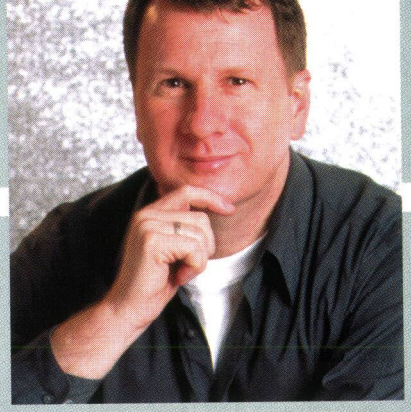
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ISSUE 296 AUGUST 2003



The last few months I've had more than my share of computing calamities. First, my girlfriend's notebook turned up its toes at the deepest BIOS level and required a hard drive transplant just to recover the files. Then my *own* notebook began sending signals that it was overdue for an OS overhaul, which meant the mandatory clean reinstall of Windows.

Finally, a marauding virus marched through a friend's hard drive — and despite paying some PC troubleshooting experts to set things right, he ended up resorting to a total hard disk format.

Such rescue work is something we all have to do — to our own systems as well as those of our peers — and that's why it forms the crux of this issue of *APC*.

The troubleshooting feature (page 98) will help you find and fix hardware hang-ups and software stalls. If all else fails, the bootable emergency CD should help you set things straight.

There's also our guide to reinstalling Windows the smart way (page 118), and to help finish the job, we've crammed over 200MB of essential apps onto our cover CD set so you can sidestep that long (and possibly expensive) download session.

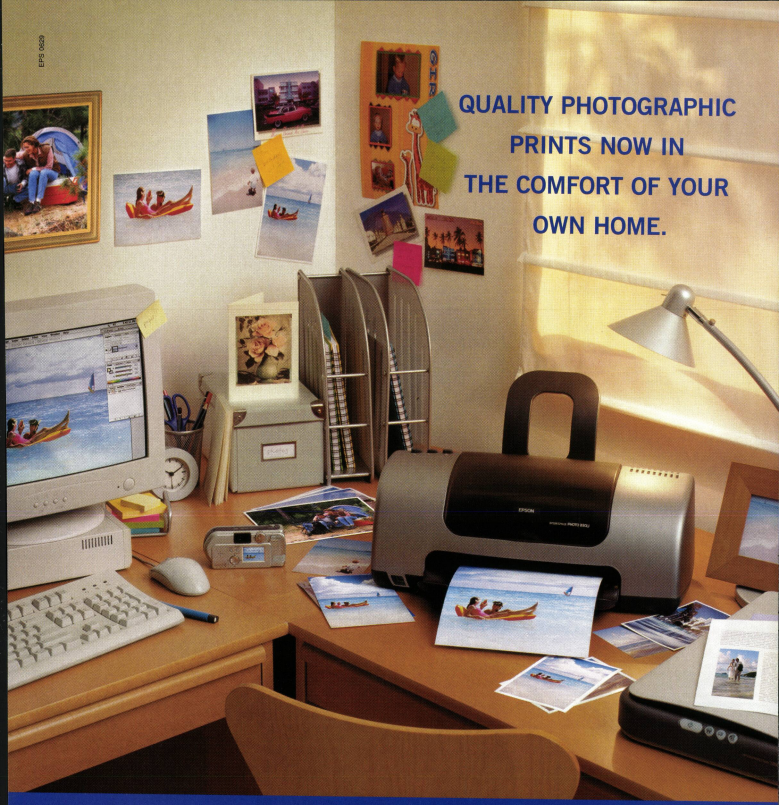
Once all is well, take a system snapshot with the free version of Drive Image 5.0 on the cover CD set so you'll be ready for a rapid recovery the next time around.

Of course, at some stage during the reinstall process you could encounter product activation. This isn't a process that *APC* is fond of. We'd rather not have to go through these additional hoops. But if it has to be done, why can't the process be as painless as possible for the user — especially after an innocent upgrade or a hard disk reformat? Why treat paying customers like pirates? With that in mind, read Garth Montgomery's product activation rant in Dispatch on page 28

We also want to hear your thoughts on PA — write to **epinions@apcmag.com**.

David Flynn

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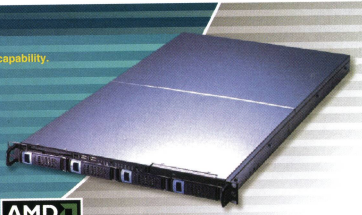
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1U MAXTRON SERVER 115

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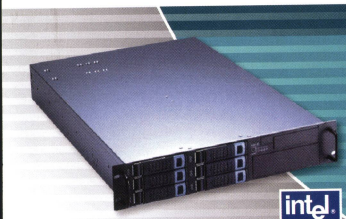


- 400W Slim Power Supply.
- Dual AMD Athlon MP 2400+ CPU With Special Cooling Kit.
- Tyan Thunder K7X Pro S2469UGN Server Board, AMD-760 MPX Chipset, Adaptec U320 SCSI Controller, 8MB Graphic, Dual Intel LAN (Gigabit + 10/100M) on board.
- Adaptec 2010S Zero Channel RAID 0,1,5 Controller.
- 4GB ECC Registered DDR RAM.
- 4 x 36GB SCSI SCA Hot Swappable HDD.
- Black Slim CD-ROM/DVD & FDD.

Dual Intel Xeon processor configuration also available.

AMD

2U MAXTRON SERVER 214



Highly Scalable Dual Intel Xeon Server for Mission Critical Applications.

- 400W Power Supply (Optional Redundant Power Supply).
- Dual Intel Xeon 2.8GHz CPU
- Tyan Thunder i7501 S2721UGN Server Board, Intel E7501 Chipset, Adaptec U320 SCSI Controller, 4MB Graphic, Dual Intel LAN (Gigabit + 10/100M) on board.
- Adaptec 2010S Zero Channel RAID 0,1,5 Controller.
- 4GB ECC Registered DDR RAM(support up to 12GB ECC Registered DDR RAM).
- 6 x 73GB SCSI SCA Hot Swappable HDD.
- Black CD-ROM/DVD & FDD.

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Dual AMD Athlon MP processor configuration also available.

PEDESTAL MAXTRON SERVER 103

Powerful Small to Medium Business Server.



- 460W EPS12V Power Supply (Optional Redundant Power Supply).
- Dual Intel Xeon 2.8GHz CPU.
- Tyan Tiger i7501 S2723GNN Server Board, Intel E7501 Chipset 533/400MHz FSB, 8MB Video, Dual Intel LAN(Gigabit + 10/100M) on board.
- Adaptec 2010S RAID 0,1,5 Controller.
- 8GB ECC Registered DDR RAM.
- 9 x 73GB SCSI Hot Swappable HDDs.
- CD-ROM/DVD & FDD.

Dual AMD Athlon MP processor configuration also available.

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need to know

News, views and analysis from the IT world

Contractors in training bind

Many computer professionals are trying to do without the costly courses that keep them up to date with technology. *William Maher* and *Garth Montgomery* report on the counter-productive trend.

IT contractors are resisting the pressure to spend thousands of dollars on certification courses from Microsoft, Cisco, Novell and other technology vendors, says the Australian Computer Society.

"In the last 16 to 18 months they've been spending very little," says ACS president Richard Hogg.

Demand for training is lagging across the market, especially from out-of-work contractors who must pay their own way. Many people are opting for cheap online certification rather than full classroom courses.

This follows reports late last year that demand for flagship programs such as Microsoft Certified Systems Engineer (MCSE) and Microsoft Certified Systems Administrator (MCSA) was flagging.

from $5,000 to as much as $15,000.

It's enough to make most people think hard about their options, says Icon Recruitment's Jill Noble. "It's a big decision. They're weighing up the pros and cons before they jump in and spend."

But training providers and job recruiters say that without extra qualifications, it will become increasingly difficult to compete for work. Since the staff cutbacks of the tech crash, computer professionals have had to look at becoming jacks of all trades.

Employers are applying some of the pressure to sign up for certificates such as MCSE and those for more niche skills, says John Dowell, the head of training provider Monash IT.

"You hear of cases where the system administrator is looking after desktops and a three-tiered Web site involving Java programming or design, and also has to look after things like IT security and server configuration. That's ridiculous."

University students are also facing the prospect of paying extra for Microsoft or Novell badges on top of their university fees.

Dowell said up to 400 university students were doing Monash IT courses at any one time, shelling out money on top of their university fees, in some cases just to get an interview when they intended entering the workforce.

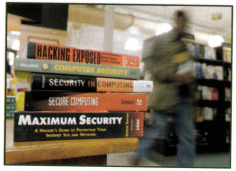
"Students are finding that once they finish their degrees, in this climate it's not going to even get them to the interview stage," he said. "We don't guarantee them a job. You can't. But in a competitive market, they know they've got to do it."

"But I have to take a week off work — which is unpaid — plus pay the cost of the course."

The trend comes in a declining market for tech workers who four years ago enjoyed booming opportunities. Statistics show that average salary increases are the lowest in 11 years. About 24% of contractors had to cut their rates to keep working in the 12 months to April, according to the ACS Renumeration Survey.

Computer professionals simply don't want to pay for courses in a downturn, says Mark Parsonage, a telecom network administrator who recently completed MCSE, MCSA and Cisco Certified Network Associate studies. "The problem is sheer expense. If an employer paid for my courses, I'd do more. But I have to take a week off work — which is unpaid — plus pay the cost of the course."

Training for a qualification badge from Cisco, Microsoft and other companies costs



Sometimes out-of-work contractors are at an extra disadvantage. They have to pay full course fees while some IT training providers give hidden discounts to employers who send in staff.

The situation highlights how staying employable has become more complicated

Continued on page 17

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Notebooks flex muscles

Intel's redrawn mobile CPU roster includes a new desknote-class processor, a faster Pentium M — and a desktop Celeron?

As tipped in May's *APC*, Intel's latest silicon play aims to capitalise on the desknote category, ready the Pentium 4-M for retirement and rebuild the category around the Pentium M.

Last month the chipmaker introduced the Mobile Pentium 4, a desktop-notebook hybrid CPU that sees notebooks nudge past the 3GHz mark. The chip is designed to tempt vendors away from building notebooks based on the desktop Pentium 4 platform, while baiting buyers with higher clock speeds and lower prices than P4-M machines.

The MP4 clocks from 2.4GHz to 3.06GHz (the P4-M tops out at 2.6GHz) and is being offered to OEMs in thousand-lots starting at US$198 for the 2.4GHz slab. This is only US$16 above the 2.4GHz P4, and undercuts the 2.4GHz P4-M by US$136.

The new chip boasts a beefy 533MHz bus against the P4-M's 400MHz. The companion i852 chipset supports 2GB of memory (P4-M 1GB) using DDR266 and DDR333 RAM. L2 cache remains at 512KB and Intel has retained notebook-friendly touches such as dynamic sleep states and SpeedStep, which can throttle as slow as 1.6GHz to extend battery life. Hyper-Threading remains off the menu, although it's expected for a future release.

What's it all about? Seeing much of its fortunes written in the mobility stars, Intel is dramatically recasting its roadmap, to the extent of readying the P4-M for retirement. Intel's new master plan divides the mobile market into six slices ranged on size and weight, with two overarching categories: portability and mobility.

Portability is the domain of full-size workhorse notebooks powered by the P4-M, as well as MP4 desknotes aimed at the "occasionally mobile". The emphasis is on moving the PC (usually within reach of a 240V socket) rather than using it on the move. This pushes conventional buying attributes such as battery life, size and weight lower down the ladder in favour of desktop-class performance, features (CD-RW and DVD drives are often standard) and screen size.

Intel's portable machine hallmarks are: 13-15in screen, weight about 3kg, thickness 40+mm, and two or three drive spindles.

"Intel's processor segmentation has exploded," said Ideas International analyst Peter Cullen, "and this is made more confusing by the branding of processors. For example, the Mobile Pentium 4 versus the Pentium 4-Mobile. Which is which?"

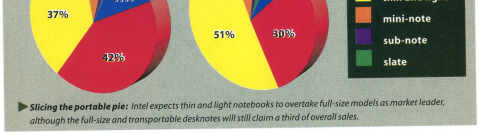
It's a question sure to be echoed by corporate and consumer buyers. Both chips occupy the same category of "portability" which Intel sees shrinking from 53% to 36% of the total notebook market by 2007 due to increased uptake of Pentium M machines. But it's the newer MP4 which has performance-friendly attributes such as faster bus and support for more and faster RAM, as well as a substantially cheaper price.

Cullen believes the writing is on the wall for the P4-M. "Intel is in a transitional situation where the Mobile Pentium 4 is on the up-ramp of its life cycle, and the Pentium 4-Mobile is on the downslope. It's just had its last speed kick."

(See this month's On Test section for our exclusive review of the first Mobile Pentium 4 notebook, the Dell Inspiron 5150).

MOSTLY MOBILE

The mobility segment's four form factors chew up the balance of sales: 47% this year, and 67% by 2007.



▶ ***Slicing the portable pie:*** *Intel expects thin and light notebooks to overtake full-size models as market leader, although the full-size and transportable desknotes will still claim a third of overall sales.*

Intel's Centrino range offers traits such as wireless connectivity, extended battery life, sleek profiles and light weight. The Centrino centrepiece, the nimble Pentium M processor, has been ramped to 1.7GHz, with the low-voltage build nudged up to 1.2GHz and the ultra low-voltage chip hitting 1GHz.

Mobility machines range from "thin and light" notebooks (13-15in screen, top weight 2.5kg, 38mm profile, twin drive spindles) to mini-notebooks (12in display, 1.4-2.1kg, sub-30mm profile, 1-2 spindles) and sub-notes (8-10in screen, under 1.4kg, single spindle, varying thickness). Each can be conventional notebooks or "convertible" Tablet PCs, where the keyboard pivots out of the way

Intel also allows for a "slate" factor — a pure Tablet PC with similar specs to the sub-note but sans keyboard — and forecasts this will grow from 1% to 3% of mobile market share by 2007.

CELERON CURVE-BALL

Overlaying this size-weight scale, Intel has added a "value" skew to accommodate the Celeron CPU family — historically given footnote status amid the tech trumpeting of the Pentium line.

The Mobile Celeron, recently ramped to 2.4GHz, is a "mobility value" proposition. Intel's wild card is the inclusion of the desktop Celeron as the "portability value" CPU. It's a 180 degree turn for Intel, having introduced the MP4 to enforce its notion of the silicon divide between desktops and notebooks. But when the fastest 2.4GHz desktop Celeron sells for a miserly US$84, almost half the price of the equivalent Mobile Celeron, it's hard to argue with OEM economics and the lure of planting more notebooks in more hands.

There are also signs that this chip may become a "budget Banias". In May Intel slipped the 600A ultra-low-voltage 600MHz Mobile Celeron processor out the door. It's not modelled on the P4-M but on a stripped-back ULV Pentium M core, with a half-sized (512KB) L2 cache, and no SpeedStep.

The 600A was tailored expressly for a Sony VAIO mini-notebook sold only in Japan. Intel is rumoured to be planning low-voltage 800MHz and 1.3GHz Mobile Celerons based on the same Pentium M floorplan.

This points to Intel shifting the Mobile Celeron architecture towards the Pentium M foundation and away from the P4-M. Taken to its logical conclusion, Intel's processors would eventually be based on one of two primary architectures — Pentium M for mobility and Pentium 4 for performance — each modified according to the needs of the market segment.

David Flynn

Video chat comes cheap with SDSL

Face-to-face online talk is about to see consumer-price tags as several ISPs begin to offer affordable SDSL plans.



Affordable video chat and home telecommuting is on the way, with several ISPs offering Symmetric Digital Subscriber Line (SDSL) at consumer-friendly prices.

The technology is similar to Telstra's ADSL, reconfigured to split the digital pipe more evenly, providing the same speed in both directions. Until now, it's been pitched at corporate clients, with prices to match.

Consumer-priced SDSL starts at $125 a month, as offered by Swiftel, Westnet, Optraweb, Norlink and others. But the kicker will be the 256/256Kbit SDSL Swiftel plans to offer for about $65 a month.

"If all you're looking for is a fat download pipe, SDSL isn't for you," says Simon Wright of BroadbandChoice.com.au. "But it's ideal for any application that sends as much data as it receives, such as file sharing, video chat, P2P gaming and any server application."

"Unlike Web surfing, with a lot of down and only a bit of up, extending your work network to home usually means an even amount of data both ways. VPNs [Virtual Private Networks] get an obvious responsiveness boost out of SDSL."

Microsoft has included VPN server and client capabilities since Windows NT4 and Windows 95 respectively, so DIY VPNs are viable for small businesses and telecommuters, says systems consultant Stuart Fox.

Cheaper SDSL services would provide the final building block because, with ADSL, files come down from a company network quickly but uploads are tediously slow.

Although Optus and Telstra offer highly secure private networks for their VPN products, security with DIY VPNs isn't an issue, Fox says. "If you use 3DES data encryption, it would take about 50 supercomputers and a couple of hundred years to break."

Video chat is expected to grow in popularity in the next 12 months as SDSL take-up increases.

The industry's standard H.323 protocol, used by Microsoft Netmeeting and others, can deliver good-quality video at 12 frames per second at 256Kbit/s symmetric speeds, and with 384Kbit/s at 25fps at reasonable quality.

Australian Xbox Live gamers will get a boost when Microsoft launches SDSL in October. Although the service officially needs only 64Kbit/s upload speed, testers report that Xbox Live generally requires more than 128Kbit/s for best performance due to its voice chat capabilities and peer-to-peer nature.

Australian gamers typically have only 512Kbit download and 128Kbit upload ADSL services on current pricing models.

TELSTRA'S KNIGHT IN ISDN ARMOUR

Telstra expects to begin offering an ISDN Internet service on a fixed-monthly-fee basis this month. It will give new options to people unable to get ADSL or cable, and for whom satellite is impractical.

The service will dramatically improve the affordability of ISDN, previously charged at $1.10 an hour for connection, plus ISP fees. Usage is untimed, with a set download limit, in line with Telstra's other broadband services, for a packaged monthly fee comparable to BigPond ADSL. Clients can be up to 18km from an exchange, improving on ADSL's 3.5km.

APC sources said two of the plans would be 500MB for $84.45 and 1,000MB for $104.45 (prices subject to tweaking).

The 128Kbit/s speed won't satisfy those looking for true broadband, and the service will operate more like dialup, with idle time-outs and session limits of 5-10 hours depending on the plan chosen.

But Telstra said the service would provide some similarities to ADSL, including the ability to use the phone while connected to the Net.

Telstra is investigating providing an always-on ISDN service through the use of Always-on Dynamic ISDN technology (AODI).

Dan Warne

Continued from page 15

since the dot com crash. While employers still favour experience over certificates, the training roundabout could become entrenched as staff try to keep up to date in a field that's constantly changing and where sticking to one area of expertise may no longer be an option.

Some people who have been working for more than 10 years in areas such as CORBA or Cobol programming are having to reskill.

"I don't think people have any choices," says Dowell. "Do I try and teach myself? We know that doesn't work that well. The online option is pretty poor — you might as well just buy the textbook — and I'm not about to go and do a three-year degree."

Universities are continually updating their courses, but they can't match the rate of technological change. Enrolments for computer courses have dropped an estimated 30% this year, obviously due to the depressed IT job market.

Parsonage regards doing the latest courses as part of "future-proofing" himself as an IT contractor.

"It's important," he says, "because most contractors are working for multiple companies, so someone with a certificate is a safer bet for a manager who doesn't have the ability to source a person's history or skills. The manager will always choose the person with the best skills on paper.

"Even though most of the real learning is hands-on, it does help to be doing a course alongside."

Training costs

Microsoft Certified Systems Engineer (MCSE)	$10,000 – $13,000
Cisco Certified Network Professional (CCNP)	$11,000 – $13,000
Cisco Certified Network Associate (CCNA)	$3,000 – $3,500
Certified Novell Engineer (CNE)	$10,000 – $11,000
Five-day short courses	$2,750 – $3,250

Costs shown are package discounts. Courses tend to cost more when subjects are paid for separately over extended periods.

Source: *New Horizons*

"Pirates" land legitimate booty

Although the company has found some music to sell legally, can KaZaA's backers reform its bad-boy image?

KaZaA, the notorious file-swapping service, has scored a deal for 200,000 "major label" songs, despite being branded as the last place to which record labels would consider licensing music.

Hounded on all sides by court battles and legal warnings, KaZaA has announced that thousands of tracks are available via Streamwaves Jukebox to users of the new KaZaA v2.5.

The tracks can't be downloaded and saved, as on other music stores like Apple's iTunes, but that function is being promised.

In keeping with the new clean-cut image, KaZaA also offers content channels where users can search, trial and buy music and video legally. There's only a sprinkling of items so far, including reggae tracks and short films.

You can almost hear the laughs from KaZaA HQ. Despite its software being one of the most popular Net downloads, the company is the black sheep in a growing number of online music shops.

Unlike Apple's iTunes, record labels have always denied KaZaA access to their catalogues, citing its users huge trade in music piracy.

Nevertheless it will be the new-look KaZaA that provides the first widescale litmus test for online music sales. Paying for files will be a foreign concept to many KaZaA users, who allegedly spend most of their time using the software for piracy.

However, if KaZaA can win the hearts, and hip pockets, of these jaded consumers, perhaps the fears of record labels and movie studios can be calmed.

That KaZaA has persevered despite overwhelming opposition is testament to the potential that awaits if it can somehow make money from 70 million or so people reportedly using the software. For the future KaZaA promises everything from extreme sports footage, wireless software, broadband services, mobile ring tones, searchable document archives, online libraries and further audio and video content.



But it's bound to be a tough fight. Even KaZaA users are now being threatened with possible lawsuits. The Recording Industry Association of America said it would start scanning people's music collections and would contact ISPs to find the identities of pirates. ISPs have said warrants would be required before they would release personal details.

KaZaA's strategy may require some clever quick-stepping to skirt legal entanglements. By licensing content through a middleman, in this case Streamwaves, rather than directly from record labels, legal challenges might be avoided.

William Maher

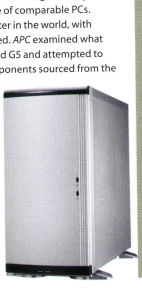
Mac's G5 on the money



It's hot (and cool) and comes in three flavours.

In between rhapsodising over the response to iTunes and the next iteration of OS X, Steve Jobs took time at Apple's annual Developer Conference to launch its new computer, the Power Mac G5. Sporting the new IBM PowerPC 970 CPU, the aluminium-cased G5 will support DVD and CD burning as standard, and the machine is set to perform as smart as it looks — at a price. Coming in low, mid-range and high-end flavours, its prices significantly exceed those of comparable PCs.

Apple claim it's the fastest home computer in the world, with 64-bit architecture and a 4GHz running speed. *APC* examined what Apple users will be getting with the high-end G5 and attempted to configure a PC with similar specs using components sourced from the upper end of the market. While the Apple has the edge in processing grunt, the dollar values tell an interesting story.



Apple G5 ▲▲▲	APC's DIY PC ▶▶▶
Dual 2GHz PowerPC G5 processors	Gigabyte 8KNXP motherboard $420
512MB DDR400 SDRAM	Intel 3GHz Pentium 4 CPU $760
ATI Radeon 9600 pro video	512MB Corsair PC3200 RAM $260
160GB SATA HDD	ATI Radeon 9800 Pro $775
SuperDrive DVD/CD burner	Seagate Barracuda 160G SATA HDD $385
Aluminium case	Sony DRU510a DVD/CD writer $620
Apple mouse and keyboard	Lian-Li PC6070A aluminium case $500 (inc PSU)
Price: $5,599	Microsoft wireless desktop $230
	Price: $3,950

Clash of the titans II

Forget Microsoft versus the Department of Justice. Now the battle to watch is SCO's rumble with IBM.

It's alleged that crucial Unix secrets found their way into Linux. Despite copping some heavy abuse from all and sundry, SCO has upped its damage claim from US$1 billion to US$3 billion and revoked IBM's licence to sell its Unix-based AIX operating system.

Sneakier still is Sun, which is trying to squeeze extra sales from IBM's woes by offering trade-ins to customers concerned that IBM will face legal ramifications.

Analysts are tipping another costly, drawn-out battle to thrash all this out.

At least there's some satisfaction for the Linux PC crowd — Apple has also struck strife for bragging about the Unix underpinnings to Mac OS X without a licence for the Unix trademark.

William Maher

Exchange: **Eugene Dozortsev**



Eugene Dozortsev **runs Computer Associates' Melbourne AV research labs, where a 20-person team dissects the daily dose of new viruses, which are increasing in complexity, frequency and payload.**

How many viruses do you see each day?

Over the last 30 days we received 19,181 files from customers. 10,072 were automatically determined to be clean. And 2,782 actually were known malware [malicious software]. 6,627 had to be manually analysed. 497 were new files we'd never seen before and were identified as malware. So if you asked how many new viruses we detected last month, the answer is 497. This puts new malware at 2.6% of all customer submissions. And we had to put in protections for all the new malware we identified, which means we put out about 30-40 new protection signatures per day. And we receive many more samples and files from industry cooperation with our competitors.

How have viruses changed in the last two years?

In general, we see more complex viruses [now]. Sometimes by looking at a file you can determine if it's [a] real professional job. [The] majority of viruses are variations on old ones. But the amount that are well written and professional have definitely increased.

What's the difference between a well written virus and one that's not?

It is software, and because we're programmers we know the difference between good software and bad software. So some of the viruses we receive are good software. But in the last two years in particular we've seen more vulnerability exploits.

So previously the viruses were a single vector infection virus. It would infect memory, or the boot sector. Now we see multiple vector infections all the time. And they will exploit vulnerabilities in well known Web servers, databases and email software. Now there is also P2P networks for additional spreading. So it's not just the Internet, it's quite specific LANs.

Internal SMTP engines are included now in the viruses. Previous mass mailers relied on Exchange and Outlook. Not anymore. There are well written internal modules that would mail the virus itself and wouldn't need an address book online or any capabilities in Outlook or Exchange. New viruses actively search DNS servers and contact them directly. It's also very common to spoof from an address. If you don't use digital signatures or some PKI they can spoof from an address and you can't do anything about it.

They also install network Trojans, they do a lot of buffer stealing and buffer cracking. It's [a] more professional [standard today].

What is the virus writer's goal?

I have no idea. The only answer I can give you is that people can be driven by different reasons.

There are people who realise what they are doing is wrong but don't think it's a big deal and want to see what can happen. These are mostly students, script kiddies. The second group of people seek fame. They put their nicknames in the virus and want to see their virus proliferate, see the media reports and that their virus has disturbed hundreds of thousands of people.

The third group of people want an outcome from their activity. Blackmail. People will send a virus into an organisation to wreak havoc, and then the virus writer will [demand money or they'll] unleash a virus that will cause [more] damage.

Do businesses pay the money?

I don't know. [It represents] less than 1% [of virus activity]. The last group of people [writing viruses] are hacktivists. During a war you see people deliberately trying to wreak havoc on their enemies. Again, only happens less than 1% compared to the other stuff.

So is the security industry being held hostage by people who are just mucking around?

It's a numbers game. If you calculate how many people in all the antivirus vendors, there are probably 1,000 antivirus researchers in the world. How many people are planting viruses? I have a feeling it is more than 1,000. More than 10,000.

You're outgunned?

There are more people playing with viruses than there are addressing these problems in research labs.

There's plenty of rhetoric from software makers about how seriously they take security issues. Given the volume of exploits out there, what are they doing wrong?

I'm really far away from pointing my finger at Microsoft. Redmond is doing everything it can to address the security issues.

First of all, it's an issue of security versus usability. The most secure computer is no network, a complete vault from the outside. How good is this computer? It's a terminal. If you want usability you run into issues of security because usability means openness and when you open stuff you've got to watch it.

Secondly, users are driving vendor development. We don't sit and dream up features which would be nice to have and are secure. What happens is, users say, 'I need this, and I need it yesterday'. When you've got products as widely used as Microsoft's, then you have lots of people trying to break it. I'm surprised how well they handle it. What they do on their scale is amazing.

Microsoft says Paladium and changes to the motherboard will put security people like you out of business.

I do believe that Microsoft is making every single effort to do the thing right and put in as much security as possible. But the sheer complexity of the software, the systems and interruption . . . the statistics would tell me that they can't cover all the holes anyway. There will be ways to violate it.

Should they even bother then?

Yes they should. There are immediate results. For two or three months there will be less attacks while people are still researching [how to attack]. But the more people address this, the more awareness there is around them. The more people address it in development centres like Microsoft, the better it is for the environment.

Is there any emphasis on researching what might happen next in terms of the next wave and style of viruses?

We spend a lot of time researching infectable products. It's part of our normal routine. Every researcher looks at vulnerabilities [of products], at strong points and weak points. We're trying to predict where [viruses] are going to go sooner. For example, when Microsoft is going to announce new software, we spend a significant amount of time researching it, making sure we can give Microsoft feedback on what we find. We try to predict things but it's a numbers game remember. There's always more people doing malware than fighting against it.

Is it legal to . . .

download copyrighted music from KaZaA?

Up until midway through this year, that question was a no brainer. However, KaZaA 2.5 allows legal downloads of certain copyright material offered via an agreement with the company. Anything else is a no-no. With the Record Industry Association of Australia (RIAA) vowing to crack down on individuals in the States, it may only be a matter of time before that happens locally.

Furrowed browser

The browser is still one of the most used apps in any online PC, but its future development is in question.

The browser was the application that, more than any other, changed the face of computing forever. For mainstream users, it was a gateway to the Internet. And with user interest came corporate interest.

Even Microsoft reoriented its strategy when it became apparent that the browser was the killer Internet app. Netscape and Redmond's market value soared as the Internet boom brought the masses online.

Much has changed since the heady days at the end of the millennium. The browser is still the most commonly used Internet application, but the development well is running dry. Microsoft, after spending a king's ransom fighting the browser wars, then the courts for its associated antitrust violations, has ceased standalone development of its Internet Explorer browser.

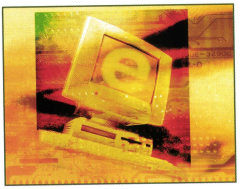
The company claims that further evolution will be heavily tied into the operating system, so according to IE program manager Brian Countryman, "further improvements to IE will require enhancements to the underlying OS".

The once dominant Netscape seems to have finally fallen in line with Microsoft's plans. America Online (now AOL Time Warner) paid billions of dollars in 1998 for the company. Netscape fans derided the buyout; AOL was regarded as "Net for newbies". Their worst fears were realised as the company didn't adequately fund its acquisition.

The stifling of development allowed Microsoft's competing browser to erode then overtake Netscape's market share. Half a decade later and the once-imposing graph of Netscape's browser market share is almost flatlining at less than 5% of total use, along with other browser minnows.

And while alternate browser fans defend the Mozillas and Operas of the world, there's an underlying acceptance that the chances have long passed of a white-knight investor pumping capital into making a tilt at IE.

The terms of the Microsoft and AOL



Time Warner settlement in May (AOL Time Warner had alleged antitrust violations) was the final nail in Netscape's coffin. Netscape's owners agreed to a seven-year contract with Microsoft, tying them to using IE as their browser of choice.

Microsoft agreed to pay US$750 million to AOL as part of the settlement, which includes promises of collaboration on the direction of digital media online.

For home computer users, the move is more symbolic than practical. By eliminating the last vestiges of IE's only real competitor, Microsoft's message is clear: stay with us or get left behind.

Justin Kranzl

Data Dump

Number crunch

Microsoft settlement with AOL Time Warner US$750 million	AOL Time Warner's debt US$26 billion
Telstra's buying price for Solution 6 in 1999 $50 million for 15 million shares	Selling price in 2003 $16-17 million for 32 million shares
Amazon's pre-orders for the fourth Harry Potter book, *Harry Potter and the Goblet of Fire* 410,000	For the latest Harry Potter book, *Harry Potter and the Order of the Phoenix* 1.3 million
Songs sold online via Apple's iTunes service in the first two months 5 million	RIAA-endorsed online music sales in the last two years: 0
Market value of Oracle US$73 billion	Oracle's bid for PeopleSoft US$6.3 billion

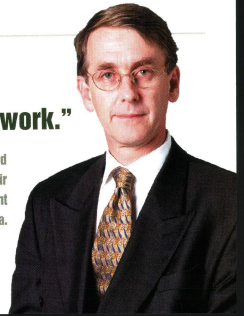
1 billion

Intel shipped its one-billionth x86 CPU this year, 25 years after the 8086 microprocessor debuted in 1978. For a brief history of x86, visit **www.intel.com** and search for x86 anniversary.

Quote file

"When we have invested $1 billion in an over-the-horizon radar, I'd hate it to be ruined by someone who wanted to run a mobile phone network."

Patrick Hannan, the Australian Defence Force's chief information officer, is concerned that enterprise is eyeing defence communications. Business is attracted to their capacity for "harmonisation", or the ability for foreign allies to use their equipment on Australian soil and vice-versa.

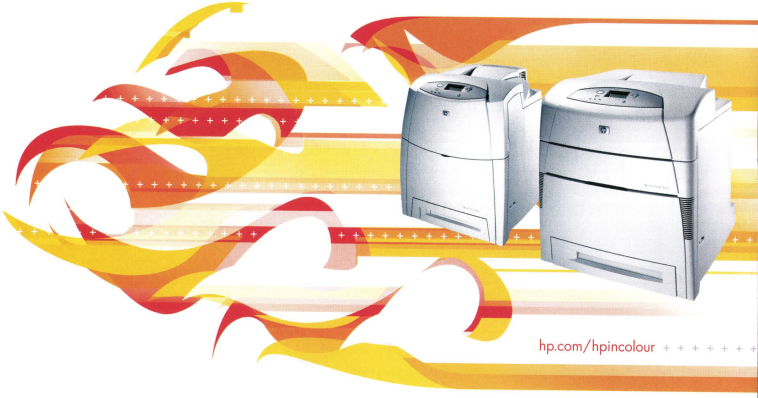


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Truly madly 3Deeply

3D desktops and monitors are just around the corner, but they are far from perfect, writes *Justin Kranzl*.



Desktop 3D is the new potential goldmine for tech companies. Software developers are releasing beta versions of 3D desktop shells and 3D monitors will begin appearing in the next two months.

Key hardware manufacturers, software developers and content creators have joined the 3D consortium (**www.3dc.gr.jp** — an English site is in the works). Members include Sony, Sharp, Sanyo, Microsoft, Intel and SGI. Their stated goal is to "encourage the growth and development of a fully-fledged market for 3D applications and products".

Despite this attempt at a unified front, commercial interests inside and outside the consortium have set hardware and software makers on divergent courses. The software people, already competing for market share, are racing to create 3D solutions in code. Hardware manufacturers are playing catch-up to make the heady leap to 3D.

The approaches are incompatible, but at stake is nothing less than the founding of a new age of computing.

VIRTUALLY UNIVERSAL

Designers and gamers have been using 3D applications for years, reverting to a 2D interface when they've finished with the software. The practice is familiar, it's homogenous and it works.

But that's just the user's point of view. From the tech company standpoint, the 3D desktop is the place to be — and stay. The major PC industry players have a stake in seeing consumer interest in the field grow because new graphic technologies drive PC makers, component companies and operating system developers alike.

OS developers need new technologies to drive their products, as well as new PCs on which to install them; PC makers need increasingly powerful parts to put in new machines.

And they all know that there is no more compelling draw than the long-awaited move to a universal 3D computing experience and the world of virtual reality it makes possible.

Commercial interests would have users believe it's a matter of education. Designers working on 3D interfaces and desktops point out that the average user lives in a material 3D world and would be likely to relate to a 3D desktop more intuitively.

So when a cottage developer such as OpenCroquet (**www.opencroquet.org**) releases a beta 3D desktop, the results are similar to the competing apps. The user's field of view moves "in" and "out" of the screen, with the ability to place icons and shortcuts on the walls or periphery of the apparent space.

Variants such as MacWarriors 3DOSX (**www.acm.uiuc.edu/macwarriors/eoh2k2/3dosx/index.html**) have more free form spaces, but it's largely the same concept.

The notion of depth of screen, so familiar to gamers and designers working in 3D, gets transported to mainstream users — if their hardware can handle it.

BEYOND THE SCREEN

The hardware manufacturers' message is that effective 3D requires considerable processing and video-output clout. And that's just to display smooth 3D visuals. They are on the hunt for ways to project beyond the flat 2D screen surfaces of monitors, televisions and projectors.

PCs are frequently upgraded, but monitors tend to sit around longer. The manufacturers haven't been asleep, waiting for those 17in LCDs or behemoth 21in CRTs to die. For them, a 3D desktop full of 3D applications is the chance to expand the $28 billion global monitor market.

Sharp certainly thinks it's on a winner with its 3D monitor, expected later this year. The concept seems simple: two flat screen layers sandwiched together, each outputting imagery.

View them at the recommended distance of about 40cm and the eyes blend the slightly different images into one 3D, stereoscopic impression.

Critics on Slashdot and other online discussion groups argue that such "3D by trickery" is a sideways step. They say that compared to volumetric 3D, where each object occupies a hologram-style dimension, stereoscopic images are a "mere" illusion.

But in the absence of effective holograms coming to a PC near you, the illusion alone is enough to perk up the monitor and high-end video card makers.

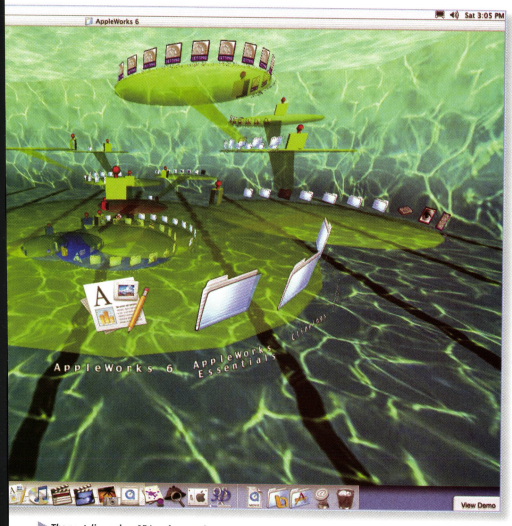
WORKING SMARTER

No matter how sophisticated the hardware gets, it will still need applications that can take advantage of the power on offer. That's where the software developers have stolen a march on their hardware counterparts. New-technology manufacturers usually need new software applications, but it doesn't always apply the other way around.

For many software innovators, the vision of the 3D desktop revolves around working smarter — using software to enhance and escape the confines of conventional PCs.

But it's a tall order to move past the two decades of user familiarity and developer refinement represented by current desktop interfaces.

Richard Moore, a designer with the popular KDE desktop environment, agrees that it's slow going. "Over the next few years I expect to see evolutionary, rather than revolutionary changes to the desktop —



The next dimension: *3D interfaces, such as MacWarriors' 3DOSX, introduce the concept of depth to the desktop.*

trends such as greater use of multimedia, more 3D and more use of transparency are likely to continue."

And just like 2D desktop developers, every designer working on a 3D application has their own concept of an ideal environment and interface.

MICROSOFT CAUTIOUS

One outfit not heading for 3D desktops in a hurry is Microsoft. It knows that even minor ripples on the surface of its user interface can have an impact of tidal wave proportions on the global scene.

It's been quite a while since Redmond experimented with a true 3D interface. Video of Microsoft's TaskGallery project (**http://research.microsoft.com/ui/TaskGallery**)in 2000 shows engineers and designers extolling the virtues of navigating in a 3D environment, and pointing out the shortcomings of the existing 2D system.

"To switch tasks," says one, "we have to hustle . . . burrowing through the heap of information we have not-so-conveniently stored on our computer's hard drive."

While Microsoft is promising a 3D desktop in the upcoming Longhorn OS, it's more of a driver shift than an interface shift. Redmond is endeavouring to move most of the effects display to the video card.

Scalability features mean that the more powerful your card, the more media-rich your experience. Power users have little time for bells and whistles, but the important thing is that the desktop will have integrated 3D support.

2D INERTIA

One piece of information absent from the 3D hype is exactly what productivity gains are to be made. The increased level of intuition promised by 3D desktop developers is counteracted by the ease with which users are navigating in 2D.

Web design guru Jakob Nielsen was an early critic of 3D desktop concepts. Comments he made five years ago still carry weight: "Sometimes physical objects work better in 2D. A help system explaining how to replace a hard disk in a computer chassis may be better off with a schematic drawing from exactly the perspective that highlights the correct spot.

"[But] 3D works for games because the user doesn't want to accomplish any goals beyond being entertained."

To date, 3D applications have benefited from being specialised. Despite the flexibility of 3D game or design programs, there are tight constraints on the kinds of behaviour permitted within them.

This not the case with current desktops, which are expected to be the transport for multiple tasks running simultaneously. Developers have to walk the tightrope between offering competitive levels of flexibility in their desktops while not allowing the code to overwhelm the needs of other applications.

And there are still such questions as how a 3D application or desktop becomes more efficient than the 2D standard, and who genuinely needs to use a 3D word processor?

BROWSER TWEAKING

Without a clear value proposition at the consumer level, science fiction remains the place for utopian images conjured by cash-hungry computing vendors.

Consumers may gradually benefit from the effects of the corporate race. Changing an entire desktop to 3D — along with user work habits — is a huge challenge perhaps best approached a little at a time.

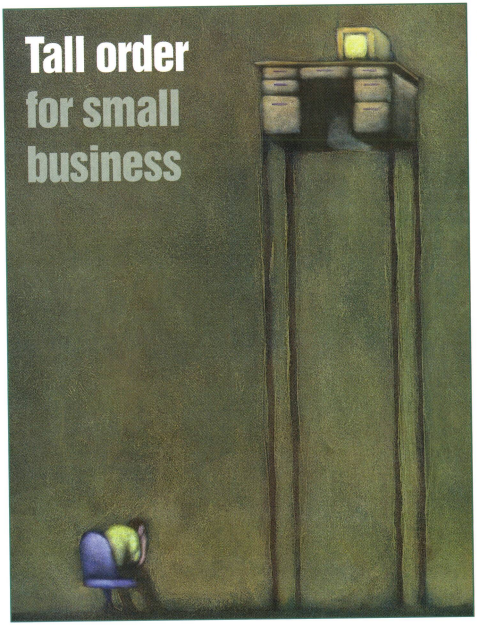
What better interface to start tweaking than the one with the most explosive growth, the browser? Given that many users spend as much time online as they do interacting with their desktop, it's a good way for developers to get their feet wet.

VRML and other promised 3D online experiments failed to deliver, but 3D browsing is arguably the most dynamic area of development for mainstream users. Intel, AMD, Sun Microsystems, even the likes of aircraft giant Boeing, are backing programs such as OpenHSF (**http://developer.hoops3d.com/openhsf**) and the Web 3D Consortium (**www.web3d.org**). These outfits are dedicated to creating 3D interface and data transport standards online.

Of course, 3D desktop developers are among the most avid observers of the Web's 3D practitioners. They know a simple browser is enough to force Microsoft to completely re-orient its OS products and business model.

They are no doubt hoping that the glittering promise of efficient 3D for the masses will have a similar effect.

Tall order for small business



While tech-heads toy with P4s and cable Internet, many small businesses are making do with dusty old PCs and dialup. With government assistance gone, can tech novices catch up in an increasingly wired world? *William Maher* reports.

There are 1.2 million small businesses in Australia, employing some 3.6 million people. While constantly being touted as the business backbone of the nation, they are also targeted by IT companies that push them to use technology that enables work to be done smarter, boost revenue and level the playing field against the big boys.

On the surface, it's go-go-go on the tech front, with promotions such as this month's Retail Business Technology 2003 exhibition in Sydney showcasing everything from smartcards to "database marketing". But behind the scenes, small business is dazed and confused rather than singing the praises of Microsoft and Intel.

While corporate office towers hum with Gigabit Ethernet and integrated IP networks, the little guys down on the street are in a parallel universe, where technology runs on the smell of an oily rag and hardly anyone gets an early look at sexy new gear like Wi-Fi or Centrino chips.

To small businesses, technical support might mean calling in a 16-year-old son or daughter after school. Even the simplest computing tasks can turn into a comedy of errors, like the time an Australian retail chain discovered the data backup tapes it had been making every week for two years were — oops — mysteriously empty.

Funding for a two-year Federal Government assistance package to help small-to-medium enterprises (SMEs) get online and tech savvy has dried up.

So are SMEs in danger of being stuck in a tech time warp? Australia's peak ebusiness body, the National Office for the Information Economy (NOIE), has spent $6.5 million in two years, providing initiatives to help the thousands of people who don't have the time or money to keep pace with technology. Most recently, NOIE produced its *e-Business Guide* booklet and accompanying Web site (**www.e-businessguide.gov.au**), but they were the last things funded under the assistance package.

A spokesperson for IT Minister Richard Alston denies that the government is taking any help away, saying the Web site and other programs still have a lifespan as long as two years from now. "These are not one-offs. The resources like the Web site will be available into the future."

However, Shadow Minister for IT Kate Lundy argues that not enough is being done to help people cope with basic PC problems. She describes NOIE support in the area as esoteric and warns that the loss of any funds could worsen the already shaky grasp some have on technology.

"There's already a digital divide in the community, but this could make it persist for SMEs," Lundy says.

While the government has been pushing its ebusiness mantra, small business is still tripping up on more basic issues. For example, confusing ISP plans, networks that don't network and databases that won't hold data, being tricked into registering Net addresses, or upgrading with the wrong equipment.

As one retailer puts it, "This technology thing is bloody painful and computer geeks don't exactly grow on trees."

With PCs, persisting is one thing small business knows about. While you might be happy if your machine lasts three or four years, shops hang on to theirs for much longer, until some literally blow up (the monitors anyway).

Even those businesses that have managed to build broadband into their future — like the camping and outdoor equipment franchise Snowgum — find that in the back room, amid the servers and wiring, they're still in the dark

compared to their wired competitors.

Snowgum has revamped its entire tech infrastructure, hooking up PCs in most of its 17 stores to a nationwide network. Instead of expensive links like Frame Relay, Snowgum uses the cheaper alternative, Telstra's HyperConnect business ADSL.

PCs also replace cash registers and costs are kept down by using white boxes. "If they fall over, we just chuck a new $1,000 box out there," says general manager Ross Elliott.

Snowgum also sells online. At this stage the site's annual revenue is small; about $100,000. Taking a leaf out of Amazon's book, Snowgum runs a paperless warehouse with stock recorded using wireless handheld computers.

Upgrades aside, some things haven't changed. The company has been using the same electronic point-of-sale system since 1988. So much for state-of-the-art.

Elliott wants to replace it, but that means ripping out the entire platform. He guesses it would cost around $100,000.

It's a different story for department stores, as he notes: "Most of them, as I understand it, put in megabucks. Their packages are tailored for them."

This GM would prefer to update sales data in real time, but there's a huge time factor in researching, implementing and training staff.

Retail staff are hopeless at looking after computers, he says. He's long been resigned to the fact that Snowgum's shop assistants are too busy worrying about the ins and outs of selling weatherproof Gore-Tex jackets to be bothered by him whining about data backups and computer manuals.

Increasingly though, the battlers are being told that when it comes to technology, they needn't play the poor cousin. The message — all too familiar to Elliott, who's bombarded three times a week by IT vendors — is that anything the big boys use, you can have too.

"There doesn't need to be [a technology gap]. These things are possible," says Adrian Bartholomeusz of Sydney IT integrator Totalis in his best salesman's pitch. "To get an average corporate environment running … you can do all of that for $2,000 on a small business level."

A growing amount of software is styled like matchbox copies of the hulking systems used at the big end of town. One package, NetSuite, gives SMEs a taste of everything from accounting and ERP to CRM and ecommerce.

Microsoft is reportedly spending US$10 billion on its campaign to conquer the pint-size market. Everywhere, the message is to hop on or risk missing out.

"SMEs who hope to have a competitive advantage will have to tap into the benefits that broadband, wireless and gigabit technologies can provide," PR material from the networking vendor Netgear warns.

But as SMEs go online and set up networks, what's simple on paper has shop owners scratching their heads in bewilderment. Melbourne art supply shop Arts on Burgundy wants to go digital — the shop's single PC could monitor sales and inventories and make stocktaking a breeze — but it would cost in the order of $5,000, and the owner doesn't know where to start.

Even niche operators transformed by ecommerce, such as Vivienne Atkinson's Australian Balloon Company, still turn to the likes of the Australian Retailers' Association for help. The association has a busy fix-it line that unravels tech jargon and cleans up the mess when computers go pear-shaped.

"It's very unfair. Technology isn't second nature to us. You're never sure if the advice you're getting is right," says the now-wired Atkinson.

The NSW Department of State and Regional Development says it doesn't focus so much on the basics of IT use — more on companies with export potential or those that need to protect their international competitiveness. "We leave the basic stuff to the private sector," says a spokesperson.

Worryingly, Microsoft's bCentral Web site for SMEs directs small business looking for suppliers to eStore, the online retailer that went into liquidation in April, leaving consumer complaints and Fair Trading investigations in its wake.

So who helps the tech battlers who can't cope with the constant onslaught of hardware upgrade bills and an encyclopaedia of must-have technology?

PCs have been needed more than ever since the introduction of the GST. The International Data Corp expects that Australian small businesses will spend just over $12.5 billion on information technology alone by the end of the year. That's a lot of cash for people who say they don't know very much about technology.

So, are Australia's SMEs setting up themselves for a future where computers are a magic bullet or a liability?

For people like Atkinson — who closed down her balloon shop and moved her entire business online — livelihoods are at stake if systems go offline. Inevitably, this dependence on IT will spread to even the smallest corner store.

"You really need someone to hold your hand," she says.

As one retailer puts it, "This technology thing is bloody painful and computer geeks don't exactly grow on trees."





Broadband on spin cycle

Telstra is too busy thinking up excuses rather than getting out into the field and genuinely tackling the problems of broadband access.

Telstra's recent announcement that it would be offering untimed ISDN Internet to consumers who couldn't get ADSL or cable broadband made great PR, but was in fact little more than a stopgap measure to ease public pressure.

ISDN has been available in the US, Europe and Asia for over a decade, yet for all that time Telstra has been sitting on its nationwide ISDN network, which was marketed primarily to corporate customers at prices beyond the reach of most consumers ($40 per month line fee and $1.10 per hour, on top of the individual ISP's usage plan).

But untimed ISDN changes that for the better. Although the 128Kbit/s speed (half the speed of the slowest ADSL connection) could barely be considered "broadband", at least consumers have access to a stable, always-on connection.

For the people choosing between satellite and nothing, ISDN is certainly a winner. Telstra claims that it can beam broadband via satellite to all Australians, but glosses over the fact that customers have to buy their own satellite dish and get increased speed only in one direction, with a dialup modem used for uploads.

Untimed ISDN is also great for those stuck on dialup, especially for people who can't get anything better than 22Kbit/s due to being on RIMs or pair gain.

But this doesn't change the fact that untimed ISDN is a solution that should have been on the connectivity checklist in the early 1990's, not the first years of the 21st century.

Even where customers *can* get ADSL, evidence is mounting that Telstra has been giving its retail BigPond division unfair access to those customers, telling competing ISPs the relevant lines are incompatible with ADSL.

Customer Steve Mann has told how he applied for iiNet ADSL and was rejected, supposedly due to excessive noise on his line. But after applying for Telstra BigPond ADSL, he was surprised to be connected "no questions asked". Telstra had told iiNet that Mann was too far from the phone exchange and that noise on his line made delivering an ADSL service impossible.

When Mann complained to the telecommunications ombudsman, Telstra offered him a generous settlement, including a refund of his setup fees, triple his monthly download allowance and other discounts.

After he told his story to the media, a Telstra manager visited Mann to advise him that the telco would be disconnecting his ADSL service, and asked him to sign a legal agreement to that effect. The telco said the provisioning of his ADSL service was a "mistake" and he should never have had it in the first place — even though it worked perfectly. Telstra has now granted Mann a stay of execution until it can provide him with a suitable alternative broadband service.

Telstra's Kerrina Lawrence said the issue was a one-off case of human error, and the processes for provisioning ADSL applied equally to retail customers of its BigPond ADSL and wholesale ISPs such as Internode, iiNet and Netspace.

Whether the case was Telstra evading its legal obligation to give competitors equal access to ADSL, or an individual employee giving a BigPond application some leeway, makes little difference. It still demonstrates the power that Telstra can wield over Australian consumers due to its total control of the copper phone lines.

It's slick damage control to claim the Mann case is not part of a systemic problem, but the telco's actions throw into question its deeper commitment to promoting a competitive broadband environment for the good of all consumers in Australia.

The Australian Competition and Consumer Commission (ACCC) has criticised Telstra's management of what is virtually an infrastructure monopoly. "Telstra is in a position to largely dictate the type of services that consumers will be able to access and the time at which these services become available," the ACCC noted in a report.

One ISP discovered Telstra was serving third party ISPs outdated data on which telephone exchanges were ADSL-enabled.

"On a level playing field, we'd have the same data on the same time scale as Telstra," said Internode CEO Simon Hackett. "In practice we do not. We have had only one exchange area in Victoria added to the wholesale-supplied database in this last week, having been absent for more than a year, while BigPond has been happily signing up customers in the same area."

The ACCC has criticised Telstra's management of what is virtually an infrastructure monopoly.

Perhaps the prickliest issue among those knocked back for broadband is the use of pair gain and RIM technology to deliver more phone services using fewer physical phone lines.

Telstra argues that this was a "best-practice" approach before broadband became popular. However, customers stuck with "virtual" phone lines and thus excluded from broadband have trouble seeing the value in this rhetoric.

If Australians are to lose their cynical attitude towards broadband, Telstra needs to stop spinning and start doing.

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with Garth Montgomery



Activation produces exquisite irony

Piracy has only increased since product activation — a difficult and costly practice that insults users' intelligence and forces them into an upgrade cycle.

You'd be hard-pressed finding anyone who thinks product activation is a sound idea. It began when Microsoft wouldn't let you install or reinstall your copy of Windows XP without offering your first-born as a sign that you weren't pirate scum. Having paid $400 to $600 for your software, you then had to jump through flaming barbed-wire hoops into puddles of acid — laughingly known as Microsoft service and support. The outcry was global.

Now product activation has grown up and moved into applications. You name it and in the interests of protecting copyright, software publishers are doing it. Product activation now infests more than 20 Microsoft products, and the likes of Adobe, Symantec and Intuit have caught the disease.

The main symptom is a huge pain in your arse from having to go through a process politely described as ridiculous.

Here's how the future pans out: you're doing your annual clean install to rid your Windows system of debris ineffectually scattered throughout its directories. Format c:\ and you have a day's work ahead of you.

But it doesn't work. The product activation "feature" of your software forces you to contact every vendor to authenticate your patronage.

Intuit recently tacked a $9 charge onto such interaction because, hey, someone has to pay for all those call-centre workers and it ain't gonna be the vendor. The 1900 number was also paid for by — surprise, surprise — you. It didn't take much intuition to predict the response: vitriolic lava of Krakatoa proportions.

The irony is that piracy has only increased since product activation became the biggest thorn in users' sides. The Business Software Association of Australia's June survey puts the rate at an all-time high since it started collecting the relevant statistics in 1996. Australia maintained its proportion of pirated usage at 32%, compared with 23% in the United States, 24% in New Zealand and 26% in the UK.

The punters have spoken. If vendors make their software too expensive and enforce inconvenient, intrusive product activation, the result can only be more illegal activity, not less. And the offenders, "inspired" by resentment, don't even feel the need for guilty consciences.

Of course, the whole concept of product activation reeks of a cynical exercise; a thinly veiled system to lock users into an upgrade cycle. In the future, if you want a new motherboard, and your current software is doing the job, vendors could view your hardware purchase as a new computer, and therefore require a new licence.

This kind of commercial attack works best when the vendor no longer supports its older software with product activation attached, so it can't be reinstalled anyway.

This is Big Brother: upgrade your software or else.

Speaking of Big Brother, Dispatch had lunch with an eminent IT security expert who spoke about the latest security issues. It turned out he's a former Russian rocket scientist from the Cold War who fled his country 10 years ago to settle in Australia.

He happily offers the view that Australian politics is much like Russian politics when it was communist. He joked that I probably thought the commies had brainwashed him. I joked that he probably thought I was an idealistic fool. It was a beautiful moment.

But nothing could stop the man from enthusing about the political model here being virtually identical to what he grew up with, only without the totalitarianism that silenced critics with Kalashnikovs and Siberian excursions.

Then Dispatch arrived back at the *APC* bunker to find six pages of mail from Senator Richard Alston, Minister for Communications, Information Technology and the Arts, taking issue with two articles in the June issue of the magazine (pages 20 and 28).

In the spirit of democratic discourse, Alston was asked to pen a rebuttal, but he refused. Instead, he demanded that Dispatch print a paragraph by paragraph response to his complaint. We regard the demand as government intimidation and won't be acceding to it.

Here's an example of what the minister took issue with: Senate estimates revealed that the minister's Web site cost $4 million to develop. Alston didn't dispute the figure. He disputed whether **www.dcita.gov.au** and the mirrored version, **www.richardalston.dcita.gov.au** were in fact the minister's sites to start with.

This is serious. If these aren't the minister's sites, then an immediate inquiry is needed to hunt down the culprits behind this brazen online fraud.

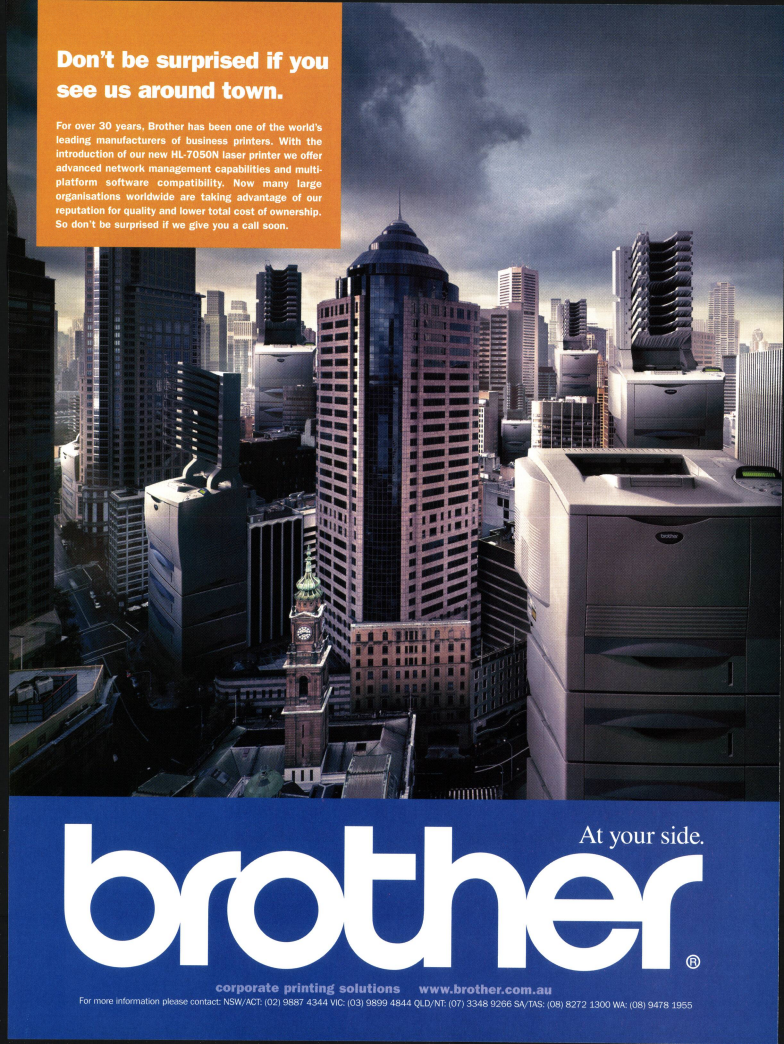
The sites have been derided as sloppy, buggy and full of crap, so we'd also like to see this crime against the meaningful use of technology duly investigated. The first case for the new High Tech Crimes Centre, perhaps.

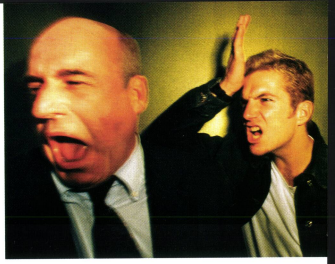
While *APC* readers can be satisfied the minister is getting valuable information from their magazine when assessing IT industry concerns and forming policy, Dispatch can't help but regard our Russian comrade's words in a slightly different light.

gmontgomery@apcmag.com

The whole concept reeks of a cynical exercise . . .

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Blue Sky whining

Your system works until you upgrade its RAM. The vendor says it can't find the problem, so where to from there?

Michael Gooch rang Watchdog with major PC problems. "Three months ago I bought a PC from [Sydney-based] Blue Sky Computers and I think the motherboard is playing up," he said. "It's an ASUS P4-S533-X with two DDR and two SDRAM slots, so it can take either type of memory.

"I'd been using SDRAM and it worked well. I bought some DDR RAM to upgrade and, once installed, the PC began displaying error messages. I took it back to Blue Sky Computers but they didn't know what was wrong with it. At first they blamed it on Windows XP.

"I've taken it to a technician who spent five hours looking over it, and he thinks it's the motherboard. Is there anything you can do?"

The ASUS motherboard Gooch bought as part of his system is marketed as a solution for users wanting to upgrade without immediately losing their SDRAM. The ability to switch to DDR RAM is one of the board's main selling points for budget upgraders.

Gooch had two issues with Blue Sky Computers: he wanted the PC he had put together to work with DDR RAM, which the motherboard specifically supported in addition to SDRAM; and he wanted a quick, clean resolution once a fault was found.

Gooch said he got the impression the Blue Sky staff were trying to wear him down so he would go away. "I couldn't believe the drivel. They told me it could take a month to fix."

With the technician's second opinion in mind, he was frustrated by the store's inability to come to the same conclusion.

When Watchdog spoke to Jane Wu of Blue Sky Computers, she seemed startled on hearing of Gooch's claims. "He just left the store," she said, "and he seemed happy. Then he rings you to complain. What does he expect us to do? He is a very unreasonable person . . . he demands everything."

Wu said that since Gooch had brought in the computer the day before, Blue Sky's technician had devoted much time to diagnosing the problem. "Our technician worked until midnight and is still working on it today."

The techie thought the errors might be

When Shuttle diplomacy fails

Dear Watchdog,
Largely due to it receiving an Editor's Choice award (*APC* June, page 64), I placed an order with EYO Technologies in Sydney last month for the Shuttle SN41G2 system.

The unit was dead on arrival due to a faulty CPU socket, so I requested a refund on the purchase price.

However, even though I had returned the system within five days of receiving it, EYO's policy states that it will only refund if the manufacturer replaces the entire system.

Shuttle returned the unit to EYO with a replacement motherboard.

So I decided to give the Shuttle another go (against my better judgement), and while the CPU socket was fixed, the USB ports appeared to be faulty.

Once again I've had to pay shipping costs to send another defective unit, and I am getting the same response from EYO regarding another request for a refund.

I am waiting for another defective system to get fixed, and there are no guarantees that the next unit won't have other issues.

I'm sure my experience with the Shuttle SN41G2 is uncommon, given all of the positive press I've seen.

What I'd like to know is: do I have any other recourse but to accept a system that I'm no longer interested in?
Lou Tsiros
Melbourne, Vic

Lou seems to have struck uncommonly bad luck. A quick check with APC Labs revealed that the boxes* APC *received were intact and ran to spec without issues.

Watchdog contacted EYO Technologies to see if a compromise could be reached. The company offered an explanation (right).

Dear Mr Tsiros,
The reason why the original refund was not issued was explained to you in our initial email.

When we received the unit returned from you, the condition of the unit was, unfortunately, unsatisfactory. That includes a scratch; it has also been noted that a wrong screw was used, rendering a small damage to the case.

You accepted the no-refund policy when it was explained to you at the time of purchase. The replacement was shipped to you three or four weeks ago. We have only been notified [of] the USB problem recently.

We would like to offer the following solutions to you, and please let us know if they are acceptable:
1) We'll reimburse all the returning postage to you.
2) We'll replace the motherboard from a brand new unit ourselves to make sure it doesn't have any surprises.

Based on our experience I can assure you the Shuttle systems are very reliable — your case is an isolated one. We have sold quite a large number of these systems so far.
Nikol Su
EYO Technologies Pty Ltd

Contact us

WE WANT TO KNOW
how IT companies are really treating you. Write to: watchdog@apcmag.com or PO Box 4088, Sydney NSW 1028. Include your full contact details and any product information. All correspondence becomes the property of *APC* and is subject to editing.

coming from the video card Gooch was using and not the motherboard. She also said the store had installed Windows 98 on the PC (he had Windows XP) to test if it worked.

It wasn't clear what the company hoped to accomplish with a different OS, and Watchdog questioned why the store had taken so much time to arrive at its conclusion. Surely it would have been quicker to replace the motherboard.

"You don't know anything about the computer industry," Wu said. "These things take time. We can't just take the word of the customer. Before we replace the motherboard, we need to find out what's wrong."

She agreed that it was the store's responsibility to replace goods under warranty, but was more concerned about Gooch's attitude. "Of course it's our responsibility [but] some customers are unreasonable. They think they know everything. We have worked very hard on his PC."

When Watchdog said it wanted to resolve the matter and hear both sides of the story, Wu said: "There is something wrong with his [Gooch's] brain."

The conversation ended with no real resolution in sight.

Watchdog told Gooch about the store's theory that his video card was to blame. "I've never had a situation like this. These products are all new," he said. "The video card is a GeForce 4400. It works perfectly."

He expressed frustration that his next logical step, the NSW Department of Fair Trading, would take three weeks to get its wheels in motion.

Watchdog also contacted CMD Entertainment, where the independent technician had checked the motherboard. Craig Kermond confirmed he had concluded that the board was faulty.

"My assumption is there is something wrong with one of the DDR slots on the motherboard. When we tested with a DDR stick in slot one, the PC was stable. When we added DDR RAM in slot 2, the PC would crash."

To make sure it wasn't a faulty stick of RAM, Kermond swapped sticks in the single slot, and all was well. He agreed that five hours would have been about right to exhaustively test Gooch's PC.

Despite the apparent impasse, a resolution was reached later that afternoon, when Gooch phoned from Blue Sky's premises. He said staff had requested that he call in their presence.

Blue Sky had taken the motherboard back and refunded its cost. Wu confirmed that this was the case.

Dude, where's my service?

PC retailer GameDude Computers has been displaying an unusual approach to dealing with dissatisfied customers.

The Brisbane-based budget operator canvassed opinions on its business from three of the largest PC community sites: Overclockers Australia (**www.overclockers.com.au**), Whirlpool (**www.whirlpool.net.au**) and Queensland Gamers League (**www.qgl.org**).

The response was overwhelming, and not just in terms of numbers. The criticisms were stinging — prompting people describing themselves as the store owner and sales manager to attack the very customers they had sought feedback from.

The complaints centred around the honouring of warranties, staff attitudes and the time it took to get service. It was claimed that customers sometimes had to queue for lengthy periods on weekends.

Many businesses would be thrilled to have queues of customers wanting their opening hours to be extended, but GameDude Computers doesn't appear to be one of them. On the company Web site, staff members took various positions on the issue.

A person identified as "Dorian", said to be the company's owner/director, explained past experiments with different trading hours.

Sales manager "Kathleen" wrote: "We know that geeks don't usually have lives, but the people who work here do, and would appricate [sic] at least one day to themselves." The comment capped her string of complaints mainly in relation to customer behaviour.

When replies came in questioning her attitude, she invited people taking her comments personally to "look at your behaviour".



Meanwhile, "Dorian" was accusing some of those offering feedback of being "pimps" attempting to further a rival company's agenda.

"We have had many years of people saying our service was poor, which it was not, and many said 'you pay for what you get' which is also not the case," he wrote.

"If you don't have the balls to admit that half of the problem was more than likely your doing then keep your comments to yourself. For years we listen to customers moan how they would rather pay a few dollars more for whatever . . . well I have a business to run, it's not perfect but neither are some customers."

When Watchdog approached GameDude Computers for its side of the story, the response was similarly abrupt. Sales manager Kathleen McGovern would not talk about the customer service issues beyond saying that the company's comments had been "taken out of context".

She could not confirm if the comments posted on the Web in the company's name had been made under instruction from management.

Watchdog asked McGovern to explain the context of the comments, but there was no reply.

Current top 3 in the 'dawg house

1. **Quicken's $9 registration charge**
2. **Telstra ADSL availability**
3. **Retail customer service**

PS2 = entertainment hub?

Every console released in recent years has been sold as an "entertainment hub" rather than a games machine. Yet to date, the gaming side has easily held sway over any other uses. Sony is hoping to give the scales a nudge early next year with the PSX. Essentially a PlayStation2 with juicy extras, its intended use seems to overlap the company's original plans for the PS3. On top of the machine's ability to play PlayStation2 games, the PSX will have a TV tuner, DVD recorder and 120GB hard drive.

The Japanese manufacturer believes the additions will allow the machine to become a home video/media centre. Online connectivity will be handled by a built-in Ethernet port (dialup access is strictly verboten). With USB 2.0 and Memory Stick support thrown in, the PSX may well fulfill the company's ambitions.

Analysts are suggesting that by making the PSX a broad-based home entertainment device, Sony will seek to narrow the scope of the PlayStation3 to gaming. At one point, its comments indicated that much of the non-gaming functions of the PSX would be incorporated into the PS3.

By having two distinct products with different aims, not only can Sony get to market earlier with a home entertainment device, but it can also cut PS3 production costs.

Momentus proves (note) worthy

Seagate has thrown itself into the growing notebook hard drive market, with help from Hewlett-Packard.

HP's involvement with the one-platter Momentus drive was in the "early development" phase, when it worked with Seagate to "define and agree on specifications".

The Momentus spins at 5,400rpm, significantly faster than standard 4,200rpm notebook drives. Seagate claims optimisation of the drive's electronics results in power consumption equivalent to a 4,200rpm drive.

This is important, the company argues, because a "normal" 5,400rpm drive would quickly tear through a battery.

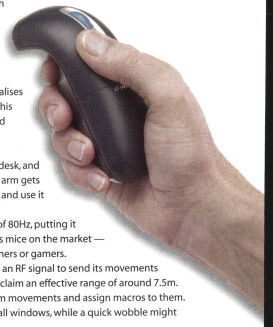
Seagate says the drive is almost 50% faster than 4,200 rpm competitors in file transfer, certain productivity apps and shutting down Windows XP. And the company claims a further 15% speed improvement when the optional 8MB cache option is in play.

The Momentus comes in 20 and 40GB flavours, and for now is targeted mainly at manufacturers.

Continued under gatefold

Shipping News

Upwardly mobile mouse



Suffering a little RSI from too much mousing? Boffins at Gyration Inc (**www.gyration.com**) have created the world's first production 3D mouse. A small gyroscope resides at the heart of the $120 Gyration Ultra that specialises in detecting angular movement. This means you can hold it in space and your hand movements will be translated onscreen.

Move the mouse towards the desk, and the pointer will follow. When your arm gets tired, you can return it to the desk and use it like a regular mouse.

The unit boasts a refresh rate of 80Hz, putting it among the most sensitive wireless mice on the market — a feature that will appeal to designers or gamers.

The tiny wireless unit relies on an RF signal to send its movements back to the PC, and the designers claim an effective range of around 7.5m.

Users can also program custom movements and assign macros to them. A swish could be set to minimise all windows, while a quick wobble might launch Explorer.

Check *APC* for a review as soon as we can get our hands on one of these upwardly mobile mice.

*nix

Trustix Secure Linux (*www.trustix.net*) is a distribution aimed at home users or small- to medium-enterprise (SME) organisations where security is a key issue. The company allows beta downloads of its 2.0 release candidate, codenamed Thunder. Among a swathe of upgrades to coding and development tools since Trustix 1.5, the new version promises an improved packaging system, added IMAP daemons (Cyrus and Courier) and a whole lot more. Thanks to a handy auto-update tool, "swup", your packages are current without venturing too far onto the bleeding edge. For full details, head to *www.trustix.org/pipermail/tsl-announce/2003-June/000166.html*.

Mac users wanting more control of their computers should contemplate taking Yellow Dog Linux (*www.yellowdoglinux.com*) for a run. Heavily based on Red Hat, YDL proves that in many ways it's easier to get Linux running on a Mac than a PC. The Mac's more standardised hardware means less driver issues. But it all depends your OS version. If you're working on OS X, proceed. If you're on Mac OS 9 or lower, read the YD site and make sure you know what you're getting into. YD can boot off a CD for later versions of the OS; for earlier versions, some hard drive partitioning may be required. YD is at version 3.0, and from all reports is stable enough to earn the interest of inquisitive Mac users.

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*Depending on configuration and usage.

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Handheld OS update

Palm and Microsoft are still battling for the handheld dollar. Redmond landed the first blow with the Windows Mobile 2003 operating system, a refresh of the Pocket PC 2002 OS. Among the more noticeable changes are improvements to network, Wi-Fi and Bluetooth connectivity, power management and the inclusion of Windows Media Player 9 for mobiles. Turn to On Test for our review of Toshiba's e750, one of the first handhelds powered by Windows Mobile 2003.

Palm's riposte is Palm OS 6.0. Codenamed Sahara, PalmSource developers say the OS draws from Palm's acquisition of BeOS and is also heavily oriented towards wireless. The company is working with wireless vendors to address security issues arising from wireless handhelds. It's a legitimate concern: in the wrong hands, a device with powerful wireless connectivity options could be a recipe for mayhem.

Despite the soft handheld market and strong



A show of hands: *HP is among the first to roll-out updated models built on the new Windows Mobile 2003 OS.*

competiton from Microsoft, Palm remains publicly upbeat about the prospects for the new OS. PalmSource CEO Dave Nagel describes Palm OS 6 as "the evolutionary path to the future". The OS is scheduled to be available to developers by the end of the year, and to appear in hardware in the first quarter of 2004.

Ericsson seeks bold new Frontier

Not content with selling lots of mobile phones and pushing fibre optic networking in Australia, Ericsson is appealing to the developer community. The company has once again signed on as sponsor of the Frontier 2003 competition (**www.ericsson.com.au/developers/frontier**) .

Open to Australian and New Zealand entrants, it has an August 31 deadline. To have a chance, submissions need to "utilise all the benefits of next-generation technologies, such as broadband and 3G telephony, to enhance lifestyle, or create tangible business benefit".

The list of platforms suitable for entry is diverse: broadband, 3G, WAP, SMS, MMS, GPRS and CDMA/1X.

There will be a short-list of six finalists. The winner and his/her entry will be flown business class to an international final.

The winners and runners-up will also have the chance of pitching their, hopefully, innovative concepts to the company's top brass.

Symantec heads for product activation

The 2004 editions of Symantec's Norton AntiVirus, System Works, Ghost and Internet Security products are expected to trickle onto the shelves between September and October.

There's little word on new features, but the line up is rumoured to include product activation. The scheme is tipped to be similar to Windows XP, Office XP and the current Aussie trial of Adobe Photoshop 7.0 (see *APC* May, page 15), using a CD key with online or phone authentication.

Symantec's US Web site indicates that the American version of Norton AntiVirus 2003 already includes product activation, so it seems that the company knows how it works. Under the new regime, users will have 14 days to comply with the activation routine.

Beyond Banias

Development of Intel's made-for-mobile Pentium M will continue with the fourth-quarter release of a second-gen CPU. It will be based on the Dothan core, with 1.8GHz clock speed (tipped to hit 2GHz in early 2004) and a doubling of L2 cache to 2MB.

Dothan will be built on a .09 micrometre die, marking Intel's first foray into nanotechnology.

Intel has also shuffled dates for the multiband wireless Centrino silicon. The dual-band 802.11a+b Calexico adaptor is now shipping, while the b+g card has been brought forward from early 2004 to end-of-year delivery, owing to the popularity of nascent 802.11g product and the ratification of the standard on June 12.

The tri-band a+b+g Calexico 2 chipset will follow in 2004.

After a year of Dothan-based CPUs, Intel will shift to what could be considered third- and possibly fourth-gen Pentium M chips in 2005-06. Codenamed Merom and Gilo, the processors will scale down to 65nm.

As with the Pentium M's Banias moniker, the names Merom and Gilo come from towns in Israel, where Intel's mobile research team is based.

Allied with new chipsets, the processors will support the next wave of PC technology, such as DDR-II memory and NewCard, a PC Card replacement which uses the PCI Express interface.

The Lindows look



The cheekily named Lindows OS is arguably the most successful mass-market distro. Designed to keep Windows users in their comfort zone, this custom-built version of Linux powers a range of low-cost desktop and notebook machines sold through US retailers, including the Walmart chain.

What's new in Lindows 4? Plenty of user-friendly features, such as improved support for digital cameras, memory keys and scanners, revamped networking, and plug-and-play support for more than 1,000 printers.

Lindows 3.0 users can upgrade to 4.0 with a single click, in stark contrast to the hoops a Windows user must jump through to achieve the same end.

The OS costs US$49.95. For more info, visit **www.lindows.com**, and watch for the full review in next month's *APC*.

Beta beat

The launch of SQL Server's next
has been shuffled back to the th
first beta should be available by
very shortly after (depending on

The bad news is that the "clos
to the public — at least not until
pops up on the warez networks.

Microsoft hopes the flexibilit
Language Runtime will appeal to
own compiled code, not SQL int

The final version of Yukon wil
XML-based file system to underp
promises tighter integration with
next iteration, codenamed Whitb

And proving that Microsoft is
calendar includes Orcas, the sequ



Shuttle not lost in space

Shuttle keeps rocketing on with its compelling range of barebones mini PCs. The latest fro
the launchpad is claimed to be the world's first small form factor PC based on the i865G
Springdale chipset. The machines the Taiwanese manufacturer has offered in recent mont
have impressed us, and the SB61G2 is the first to cater to the 800MHz FSB.

The ports roster includes FireWire, USB 2.0, a Realtek RTL8139 LAN controller and dual
S/PDIF sockets. We're expecting a boost in performance over previous models thanks to
support for Hyper-Threaded CPUs and dual-channel memory. It's safe to anticipate greatly
improved video benchmark scores too, thanks to the separate RAM channel for Intel's
Extreme 2 onboard graphics controller. The local landed price should be under $600. Visit
www.satotech.com.au for full details.

Big hopes for small disk



▶ ***Actual size:*** *Cornice's 1.5GB hard disk.*

A team of engineers from United States startup Cornice has constructed a 1.5GB hard disk in a 1in form factor, thus giving the Microdrive a serious challenge. The development has fewer moving parts than the 1GB Microdrive and, as a result, retails for about a third of the cost.

Samsung got behind the Colorado-based manufacturer and debuted a camera at the Consumer Electronics Show built on the Cornice drive. The camera is expected to be on sale from late August for a projected US$600.

Next up will be Cornice-based MP3 players, which will offer 1.5GB of storage for less than US$400.

Mega drives

If you backed a loser in the videotape format war and your Betamax VC
a large digital clock, you've probably held off springing for a DVD burn
confusing plus-minus compatibility issue gets sorted.

Now there are plenty of multiformat DVD writers to tempt you, and the latest is from Iomega. Set for release next month, its aptly-named Super DVD drive reads and writes across the full CD/DVD gamut: CD-RW, DVD-R, DVD-RW, DVD+R, DVD+RW and even DVD-RAM, for which Hitachi is still flying the flag. The unit will be available in internal and external models.



Just don't expect any of these multiformat drives to be the last word in compatibility. Toshiba and NEC are both working on the next wave of DVD storage technology, using a blue laser to write up to 36GB on a single disc.



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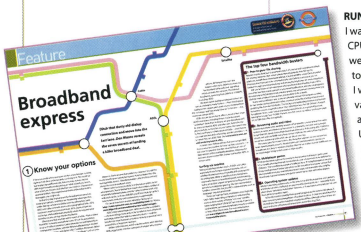
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acer
Empowering People

What about diet plans?

I was amazed that in your "Broadband express" feature (*APC* June, page 86) you chose to overlook one of the best ADSL options on offer. You seem to be so focused on those users who want vast downloads that you completely ignore the potentially larger group whose monthly downloads would average less than 100MB.

Your broadband-on-a-budget category, for those wanting email, Web browsing and a bit of downloading, describes me exactly. Yet your Editor's Choice at $49.95 is too expensive for me. I signed up for TPG's $19.95 +15c/MB plan


Feature
Broadband express
Know your options

and have yet to pay over $32 per month. I enjoy the benefit of always-on Internet and run email all day. It's great being able to use the phone at the same time.

I suspect that most of those who thirst for speed and gigabyte downloads signed up for broadband long ago. A significant proportion of the next million broadband subscriptions will be those with modest requirements who want plans reflecting this.

David Badger
Bellevue Heights, SA

Broadband Express author Dan Warne responds: "It certainly sounds like TPG's plan suits your needs well. However, to keep your usage under 100MB, you'd need to use your connection very minimally — essentially, it could be used only lightly as an always-on dialup connection.

"The APC rationale is that most customers looking to move to broadband want to take advantage of the major benefit — fast data transfer. With that in mind, we couldn't have given TPG's $19.95 plan an Editor's Choice award because any data transferred beyond the first megabyte costs 15c/MB.

"If you used just 400MB of data (which many users chew through in a few days), TPG's bill for the month would be $80. For the same price you could get our cheapest Editor's Choice plan, from iiNet, which includes effectively unlimited data (12GB at full speed and the remainder at 56K)."

RUNNING THE INFO-ATHLON

I was pondering upgrading the CPU in my AMD Athlon 1400 and went to the local computer fair to see what the cost would be. I was totally confused by the various AMD CPU's on offer, and the advice of the sellers. Undaunted, I headed home and logged onto the AMD Web site, hoping to have my confusion about the many different Athlon versions and numbers explained.

Silly me. I now nominate the manufacturer's site as the most confusing and unhelpful. Instead of simple comparisons and technical cross-references between the various models and speeds, I was confronted with a list of marketing dot points for each model with no consistency across the range nor explanation of the technical elements of the products.

The most helpful information was on the pricing page, which at least gave me the pecking order. But I'm no further forward in determining what speed and type of upgrade I should seek.

Well done AMD — for a mainstay of the computing business you've shown how not to do it.

Barrie Shepherd
Potts Point, NSW

ACTIVATING THE DEVIL

I don't like activation. It treats people like criminals before they've done anything. Let's

Letter of the month

It is warming to see *APC* acknowledge the grey areas in the MP3 debate (July, page 22) and understand that there has to be a balance struck between flexibility on the part of music labels and self-control on the part of the consumer.

Digitising your albums for personal use is not morally wrong, but the versatile nature of digitised music is easily exploited by just about anyone not burdened with a conscience. Over 13GB of music, for which I paid, sits in the My Music directory of my computer, mere mouse clicks away from global access. I am not trusted to stay my hand, even though I have no desire to make my collection available to others.

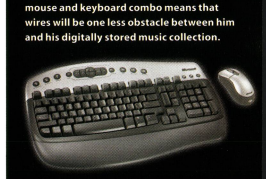
Downloading one or two tracks from KaZaA to sample an album you won't hear on the radio is not morally wrong either. Yet my nine KMFDM CDs would not justify the handful of MP3s that led me to them, were I required to defend myself in court. There is no distinction between my actions and those of the uni student (obviously not a business major) who downloads whole albums by the hundred and says it doesn't matter because they "wouldn't have bought them anyway". That, in my mind, is precisely why it does matter.

Making a legal distinction is evidently in the too-hard basket, so the only sensible solution that can be agreed upon by both sides is a legal source for digital music — iTunes. While a great idea (coupled with a nifty gadget), songs from five major record labels will hardly cater for everyone's taste. Freely available music remains what the companies with money want to sell you, rather than what you want to buy. But kudos to Jobs and Co for trying. It's a refreshing change of pace from the torrent of unrealistic thou-shalt-nots.

Simon Nix
via email

The success of iTunes isn't being noted just by APC readers, but also by the music industry. Simon's views on the moral and legal issues arising from the music copyright debate win him our letter of the month award.

SIMON'S PRIZE IS a Microsoft Wireless Optical Desktop, valued at $229.95. The mouse and keyboard combo means that wires will be one less obstacle between him and his digitally stored music collection.



Agenda:
your place to vent

face it, this is Microsoft's rather ridiculous attempt to stop piracy. And I mean, it must be secure, considering that within hours of XP's release, it was already cracked.

If Microsoft is so caught up with piracy, maybe it should look at why it's happening: massive costs for software and upgrades, when half the time the next version is even less stable than the previous one (think 95, 98, Me).

Then you have to trust that if you ever upgrade, Microsoft will believe your story and issue you with a new key.

This is why I've taken the stand of not installing anything that requires activation at that level.

I'm fine with registering software, especially if it's free, but not to that extent. Hell, I'd be happier with a hardware dongle, for crying out loud (although that's a somewhat sticky point considering they're usually for serial ports, and some bright spark decided those things are passé and not needed any more).

Daniel Keep
via email

A SERVE FOR ACER

I very disappointed with the verdict on the Acer T300 in your Labs Challenge (*APC* July, page 64), having bought one a week before getting your excellent mag.

My question is, why such a poor rating? After all, it is a P4 2.4. What can I do to get more performance from it?

I mainly use it for video capture and editing, as well as playing the latest games. Would adding a good graphics card like a PowerColor ATI Radeon 9800 and some more RAM get it to the standard of the Daitronics PC?

Tim Parsons
via email

Labs Challenge author Jarrod Spiga responds: "The Acer T300 ranked lowly in comparison to the other PCs in the roundup due to weaknesses in some areas of the system, including lack of 3D hardware support and shipping with a smaller monitor and less memory than others in the review.

"If you are using this system for gaming, upgrading to any nVidia or ATI-based 3D accelerator will significantly improve frame rate and image quality.

"The system 'as is' will be adequate for video capture, though adding more RAM will give you better performance."

VIRTUAL DRIVE ALTERNATIVE

I was looking at some of your great tricks for recovering system performance (*APC* July, page 82). It's suggested that people try using the application Virtual Drive to mount stored images as a drive letter.

I would like to mention an alternative, Daemon Tools (**www.cdfreaks.com/software/45**). This program mounts a variety of CD-images (CUE, ISO, CCD, BWT, MDS, CDI and NRG files) as a logical drive letter.

Unlike many other products, you can also mount audio and protected CDs, and it's free for non-profit use.

Chris Mousley
via email

LINUX — OR SELL THE CHILDREN

I read with interest your article comparing Windows to Linux (*APC* July, page 103). Although rejecting some assertions, I probably agree on most points. However, you left out of the equation the most significant advantage of Linux for me and possibly a lot of other people.

I am a full-time mature-age IT student with a family. We're on a tight budget and I continue to be amazed by statements in *APC* saying such-and-such a product is well priced for home users, when I would need to sell one of my children to afford it.

I am running a Celeron 333 in a computer I built myself from a collection of parts about four years ago. It will not be upgraded in the foreseeable future.

I've never paid for any software for my own use and, unlike many in the community, I will not pirate software.

I can't afford to pay for Windows, but I can benefit from the latest technologies because I run the latest version of Linux. If I compare what I can do in Linux (Red Hat 9) with the Windows I can afford (a copy of Windows 98 handed down to me for free), then Linux is the winner. And the other winners are all the people on the wrong side of the digital divide who, if left to live in a Windows world, would only become further disadvantaged.

Neal Schulz
via email

I read with interest your article on the illegal activity of downloading music from P2P networks. ARIA and the American equivalent don't help the situation. I have tried to sign up to three of the legal online distributors of music, but to my dismay discovered you can join only if you live in the US. I emailed the companies and was told that, due to licensing conditions, they were unable to offer their services outside the US. Whose licensing conditions, I wonder?

I suspect the music industry wants to control release dates for marketing reasons. It doesn't realise that the world can no longer be divided up to suit it. I want my music when it is first released, not when the marketers decide I can listen to it. And why can I buy a music CD from the US but not the digital equivalent? I'm ready to pay for digital downloads. It just seems that nobody wants my money.

Colin Lowe
NSW

Prize Pit

The winners in *APC*'s June $15,000 Massive Product Giveaway, compliments of City Software and International Software Warehouse, can be found at **www.apcmag.com/giveaway**.



Have your say

We welcome your comments and suggestions. Send email to **epinions@apcmag.com** or write to **Epinions, *APC* Magazine, PO Box 4088, Sydney NSW 1028**. All correspondence — which must include the writer's full name and postal address — becomes the property of *APC* and is subject to editing.

THE JOURNEY STARTS HERE...

Minitar Wireless LAN Cardbus Adapter



The Minitar Wireless LAN Cardbus Adapter is an IEEE 802.11b high data rate standard compatible PCMCIA card, which fully supports high data rate up to 11Mbps, 5.5Mbps, 2Mbps and 1Mbps Using Direct Sequence spread spectrum technology for immunity to interference, it is easy to install on various devices which has a 32bit CardBus controller interface.

$59

Billion Wireless ADSL Firewall Router



Features include 4 port switch, Wireless Access Point, built in VPN server (PPTP/IPSEC), SPI Firewall, URL Blocking, Port/bandwidth throttling, SNMP & Syslog Control/logging/monitoring, detachable antenna.
Free ADSL Line filter

$299

4 Port ADSL Firewall Router



This 4 Port VPN Firewall Router w/built in ADSL modem comes with a host of features including UPnP support, bandwidth throttling, detects and blocks DoS attacks, URL blocking, packet filtering, SPI. Also supports VPN embedded PPTP client/server, IKE and Ipsec.
Free ADSL Line filter

$249

Minitar Wireless LAN PCI Card



The Minitar Wireless PCI Card is an IEEE 802.11b high data rate standard compatible PCI card, which fully supports high data rate to 11Mbps, 5.5Mbps, 2Mbps and 1Mbps. Automatic fallback to lower data rate optimizes communication possibility in the worst channel conditions and over larger distances.

$69

Billion External ADSL Modem/Router



The Billion dual Ethernet/USB ADSL Modem complies with ADSL standards and supports downstream rates of up to 8Mbps (maximum) and up to 1Mbps upstream. It is designed for small office, home office and residential users, enabling high-speed Internet connections. Telstra Certified.
Free ADSL Line filter

$179

USB 2.0 Flash Drive 128MB



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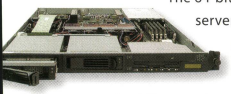
Reseller and Dealer enquiries welcome.

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On Test

Detailed product reviews and comparisons

38 AMD Opteron



The 64-bit assault begins with this server-class superchip. *Matt Overington* and *David Flynn* report.

41 **Billion 743GE**
Forget piecemeal wireless broadband. With everything from an ADSL modem to 4-way router, Wi-Fi access point and firewall, Billion has it all in one box.



42 **Pioneer Dream PC**
A take on the mini-PC concept, it's packed with goodies but exhibits a few disappointing flaws.



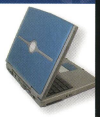
44 **PowerQuest Drive Image 7**
With this product's arrival, you've run out of excuses for losing data on your hard disk. Also examined is PowerQuest's network-friendly V2i Protector for servers.

46 **Symantec pcAnywhere 11**
The latest version of this leading remote control software lets you wield awesome administrative power. But what if that power falls into the wrong hands?



49 **Borland JBuilder 9**
The premier Java development suite boosts support for managing project life cycles but takes Java itself no further.

50 **Dell Inspiron 5150**
The first 3GHz notebook with Intel's new Mobile Pentium 4 processor out-muscles and outlasts P4-powered desknotes.



50 **DynaBacker RAID Rack**
It's a removable RAID backup unit. Plug in a separately sold adaptor and it's a pair of portable USB drives.



52 **Toshiba e750 Pocket PC**
With a faster XScale chip and the new Windows Mobile 2003 OS, Toshiba's flagship handheld has changes in all the right places:

52 **HP Photosmart 1200**
This portable flatbed scanner has plenty of appeal for the mobile crowd. It's host-powered and can load images from an SD or CF memory card.



55 **NeTraverse Win4Lin 5.0**
Linux users love Win4Lin's ability to run Windows apps on the free OS, but this release doesn't match the vast improvements that debuted in 4.0.

55 **Archos Jukebox Multimedia 20**
It's no iPod, but then again, an iPod doesn't let you watch (well, squint at) MP4, DivX and XviD video clips when you're on the move.



apc LABS Labs Challenges



Notebook megatest
From budget to blow-out, and ultra-thin to BYO wheelbarrow, we tested 50 notebooks and came up with some suprising results.

56

Affordable CRTs
If you're not rushing to join the LCD brigade, a 17in or 19in CRT can be a smart, affordable upgrade.

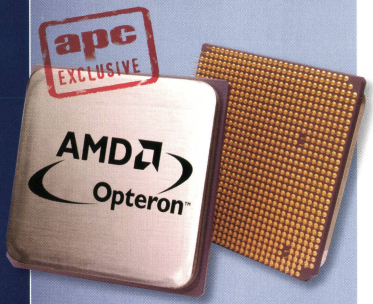


86



Image management
Overwhelmed by scanned photos and digital snaps? The programs designed to catalogue, manage, touch-up and distribute images are compared.

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64-bit Hammertime

AMD's 64-bit assault has begun. *Matt Overington* and *David Flynn* reveal the company's roadmap and test the first Opteron superchip.

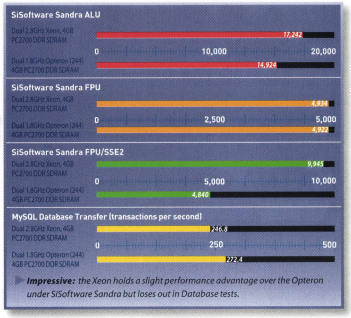
In the CPU war of the last few years, the rules of engagement have been simple. Intel's mission has been to drive up the clock speed, and AMD has sought to lower the price. It's been a predictable, almost cosy, arrangement. But 2003 will be remembered as the year battle strategies shifted.

Intel recanted on "clock speed is everything" and marked out its turf in mobiles with the Pentium M CPU and the over-arching Centrino platform. Now, AMD is making a claim on 64-bit computing in an attempt to redefine itself as a silicon innovator instead of an underdog nipping at Intel's heels.

The first salvo was fired last month with release of the server- and workstation-class Opteron CPU. The second salvo will make its impact later this year in the form of 64-bit Athlon processors for desktop and mobile machines.

Each has been built on AMD's K8 or Hammer platform and employs new x86-64 architecture running 32-bit applications natively without emulation — a feat beyond Intel's 64-bit silicon.

Intel considers 32- and 64-bit computing as occupying distinct desktop and server markets, and accordingly has developed the separate IA-32 and IA-64 architectures. IA-64 is incompatible with the 32-bit x86 instruction set used by almost all desktop applications, so the requirement of dedicated 64-bit apps has limited Intel-based 64-bit machines to the back office.



AMD believes 64-bit computing will trickle down from back-office servers onto the desktop, beginning with brutish workstation-class machines, through to the day when we'll be running 64-bit PCs.

But with almost every desktop today using 32-bit apps, the transition period between the 32- and 64-bit worlds is expected to be lengthy. AMD's K8 platform is designed to smooth the crossover, and give the company a foot in the door to a goldmine market, by enabling users to run 32-bit applications without penalty on 64-bit machines.

The x86-64 architecture maintains compatibility with x86 code yet contains extended instructions that work with 64-bit data chunks. This enables chips built on the K8 processor family to run 32- and 64-bit applications side-by-side.

SOUPED-UP SERVER

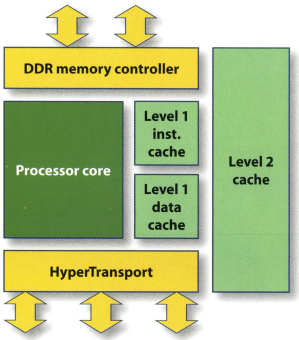
AMD's first Hammer-class silicon superslab is the Opteron chip, codenamed SledgeHammer, and it's truly a beast of a CPU. The frontside bus is clocked at an incredible 1.4GHz, with room to stretch to 1.8GHz with an equally impressive FSB bandwidth of 11.2GB/s — nearly triple the mark Intel's Xeon CPU offers.

The 1MB of level 2 cache aids in benchmarking against the 512KB level 2 cache of the Xeon, but it still falls short of the Itanium. Intel's Xeon MP and Itanium 2 CPUs also have a level 3 cache (and the associated higher price tag) that AMD's top dog lacks.

An integrated DDR memory controller dramatically speeds up access to RAM, while three HyperTransport pipes move data between processors quicker than travelling through an Intel-style Northbridge.

The Opteron ships in three basic configurations — 100, 200 and 800 series — all of which rely on conventional (read: affordable) DDR memory. Model numbers are derived from the number of processors in the system.

The 100-based units are intended to slot into the desktop space and compete against single-processor Pentium III and Pentium 4 workstations and servers. The 200-based machines are capable of challenging dual-CPU Xeon and four-way Xeon MP systems. The



Inside story: *AMD's 64-bit Opteron book-ends the CPU core with an integrated memory controller to feed data to RAM, and a trio of HyperTransport pipelines for exchanging data with other chips in a multi-way system.*

eight-way 800-processor behemoths go the knuckle against eight-way Xeon MP and Itanium IA-64 units.

Where it gets more confusing is that each series in turn contains a number of possible categories based on CPU speed. An Opteron 240 platform has a pair of 1.4GHz processors, the 242 employs two 1.6GHz chips, with 1.8GHz in the 244 version.

APC Labs secured a dual-processor 1.8GHz (Opteron 244) system packed with 4GB of DDR333 memory. We were impressed, but not astounded, by the benchmarking scores.

It pushed slightly ahead of our dual 2.8GHz Xeon test machine, and while the Xeon's Hyper-Threading saw it win out in SiSoftware Sandra ALU and floating-point benchmarks, the Opteron regained ground under real-world tests. Under 32-bit tests in uniprocessor mode, benchmarks equalled or edged out an Athlon XP 3000+ (with the Barton core), so it has the legs to take on Intel as either a server or single-processor desktop unit.

A wide range of popular 32-bit programs, from Microsoft Office XP to Unreal Tournament 2003, ran without failure.

COMING SOON

In late September, AMD will fill out its 64-bit range with the Athlon 64 ClawHammer desktop CPU, which will debut at 1.8GHz and 2.0GHz. The 2.2GHz and 2.4GHz versions will follow in 2004.

The Athlon 64 shares the same basic architecture as the Opteron, including the 130nm die and integrated memory controller, but a single HyperTransport link and a more modest 256KB of level 2 cache will keep prices in check.

However, an accidental posting on HP's Web site last month indicated the vendor was planning a desktop built on an "Athlon 64 3100+" processor, running at 1.8GHz with 1MB of level 2 cache. This suggests that AMD may continue with the confusing "performance-based" branding of its desktop and mobile CPUs, and would implies comparison with Intel's 3.2GHz Pentium 4.

Also on the menu will be the Athlon 64-M, tailored for mobile workstations, packed in a mobile-friendly shell and incorporating AMD's battery-friendly PowerNow technology.

In the first half of 2004, all three 64-bit chips (respectively codenamed Athens, San Diego and Odessa) will ramp up in speed and switch over to 90nm silicon.

SOFTWHERE?

The arrival of 64-bit silicon begs the big question: where are the apps? The answer? They're on the way, but 64-bit software development is trailing the platform's development.

Three 64-bit versions of Linux are available — complete builds from Suisse and the UnitedLinux consortium, and a "preview" build of Red Hat's GinGin64 distro. Microsoft has been beta-testing native 64-bit versions of Windows XP and Windows Server 2003 built for AMD's x86-64 code base, although there are no release dates yet.

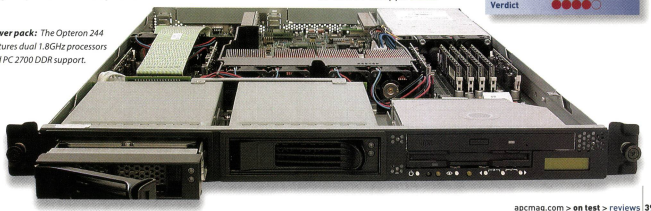
Few major apps have been ported across to the x86-64 architecture, apart from the decidedly odd couple of Apache Server and Unreal Tournament.

Most Opterons will spend their time running 32-bit software, at least in the short term.

Ultimately though, the success of 64-bit desktop computing will rest on application development, and we expect it will take at least a year to move into full swing. This means there's currently little pressure on buyers to invest in an Opteron machine. In fact, no major vendor is offering these 64-bit boxes.

However, *APC* anticipates that serious graphic designers, video editors and diehard gamers will form the vanguard that pushes 64-bit computing down to the desktop space. This being based on a desire to run the fastest system available together with AMD's flexibility in handling both 32- and 64-bit apps. ETTE

Details	
Contact	AMD
Phone	(02) 8877 7200
Online	www.amd.com
✔	Simultaneous 32- and 64-bit computing.
✖	Limited vendor support.
Verdict	●●●●○



Power pack: *The Opteron 244 features dual 1.8GHz processors and PC 2700 DDR support.*

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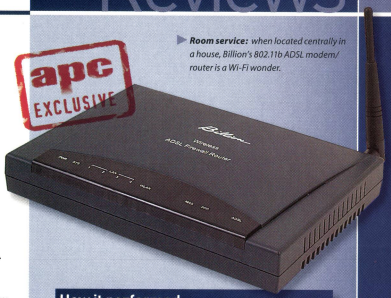
DYNAMIC RICH COLOUR
the clear advantage



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Broadband in a box

Forget a piecemeal wireless broadband network, Billion has got it all in one box.



Room service: *when located centrally in a house, Billion's 802.11b ADSL modem/ router is a Wi-Fi wonder.*

How it performed

	Time	Actual (MB)	Peak (KB/s)	Average (KB/s)
5m: direct line of sight	09:15.1	310.49	643.7	572.9
10m: some walls	09:38.3	310.29	634.8	549.7
20m: some walls; structural pillar	10:23.4	310.28	773.7	510.1

There are two approaches to setting up a broadband Net connection. You can do it bit-by-bit — buying an ADSL modem, then a four-port router to share the speed across your home network, plus a Wi-Fi access point to cut the cables and roam free. Or, on the other hand, you can purchase the Billion 743GE and get all that in a neat box, and it's only $299. It also has a hardware firewall, firmware-resident DHCP and DNS servers and IPSec.

While Billion's name isn't as familiar as some networking brands, it has a solid reputation in broadband, and this product proves why.

INTERFACE ISSUES

Hooking up the 743GE is straightforward, although its Web interface did a convincing job of disguising this. Some essential settings are hidden in fairly obscure places; others aren't labelled clearly. While the Quick Start feature sets up the broadband connection with a single Web form, it's not clear that many fields are optional and, for the vast majority of ISPs, should be left blank.

The printed documentation is even less helpful, with only a skeleton of instructions for little more than configuring TCP/IP in Windows. The companion CD-ROM is more detailed but far from comprehensive.

Once it's going, the ADSL connection remains solid. NAT routing and DHCP works flawlessly, serving broadband to a network of computers within minutes. The firewall offers three preset security levels or manual configuration to a fine grain of precision. A packet filter lets you choose which TCP/UDP ports can be used, as well as blacklist connections to specific IP addresses.

This belt-and-braces approach means that even if hackers get past the usual 64-bit and 128-bit WEP, the 743GE's MAC address filter will prevent unauthorised computers attaching to the network.

Lastly, an intrusion detection circuit logs and thwarts the most common types of attack.

KEYWORD BLACKLIST

Parental controls include domain filtering as well as a keyword filter for blacklisting Web pages that contain specific telltale words. But the controls are far from reliable.

We got around the URL filter on many sites by removing the www portion of the domain, or by replacing the domain name with an IP address. And neither the URL or keyword filters have any effect on pages loaded through a proxy server.

The status pages are detailed, with statistics covering each feature of the device. An event log, which is cleared every time the device is switched off, records connection activity, errors and dropouts.

Wireless range is excellent, covering a spacious single-storey house when placed centrally. Testing showed speeds that were similar to the Asus WL300 (a product that was awarded *APC*'s Editor's Choice in May this year).

Compatibility is faultless, with connection to everything from notebooks to Wi-Fi-equipped Dell Pocket PCs and Apple PowerBooks.

One notable feature was speed throttling, allowing a maximum data transfer rate to be specified for each of the Billion's network ports. This was tested this by playing online games on one PC while downloading large files on another. Usually, games will slow significantly, but by throttling the second computer's connection resulted in smooth play without substantially detracting from the download.

Speed throttling does have a few aspects which can hamper its usefulness. You can't throttle machines connected wirelessly, only those on the hardwired LAN. However this is a technology issue, and not specific to this product.

More seriously though, the throttling doesn't discriminate between Internet and local traffic. It applies the same speed limit to everything that flows through the port, including local computer-to-computer transfers. The Ethernet ports have the ability to automatically switch between direct and uplink, depending on what you plug in. This removes the requirement of a special crossover cable should you ever want to extend the network.

If however you do have a spare crossover cable, it's just a matter of hooking it up like a regular one.

The Billion 745GE isn't perfect, but ultimately it does the job. It has excellent performance (see box above) and sets a high standard for its competitors to reach.

Simon Wright

Details	
Contact	PC Range
Phone	(08) 8322 9544
Online	www.pcrange.biz
Price	$299
✔	Features; compatibility; price.
✖	Poor documentation; setup interface.
Verdict	●●●●○



eVent management: *the CPU fan draws air from the whole case, cooling all the components.*



Dream a little dream

Pioneer's miniature Dream PC is packed with goodies, but there a couple of weaknesses.

Micro-ITX boards — such as those in VIA's EPIA series — have been installed by many people into custom cases to enable compact, moderate performance. With the Dream PC, size no longer means a performance sacrifice. The mini-PC has gone mainstream to the point that this Pioneer unit is being sold in consumer electronics stores.

The internals are built into a ZPC enclosure just 5.4 x 18.4 x 26.3cm (HWD). The unit is capable of horizontal or vertical operation, though care should be taken not to obstruct the CPU fan at the top of the case.

Installed on the i845GV-based mainboard is a Pentium 4 CPU hurtling along at 2.4GHz, more than double the clock speed of any EPIA-based solution, along with a 2.5in 40GB hard drive, 256MB of DDR SDRAM and 24/24/12x CD-RW/8x DVD combo drive. The combo drive is slim and has a notebook-style disc retention spindle.

PINT-SIZED PRODUCTIVITY

The Dream PC, aimed at the compact workstation market, performs as well as can be expected from a system sporting its specs. Scores of 21.2 under Business Winstone 2002 and 180 from SYSmark2002 are on par with most similarly specced systems. Content creation results also suit office-based applications.

Network connectivity is handled with an onboard 100BaseT controller. There are peripheral ports aplenty, conveniently located: two USB, one serial and PS/2 keyboard and mouse ports on the back, plus headphone and line-in jacks. On the front are two USB ports, two audio jacks and two FireWire ports.

The front ports are recessed behind a perspex faceplate, which could cause problems with some bulky plugs. The external power adaptor is also notebook-esque.

To a degree, this unit is upgradeable. Replacing the CPU is as straightforward as a desktop machine's, though the i845 chipset limits you to 533MHz FSB Pentium 4 CPUs. The micro-ITX board has only one SDRAM slot, so upgrading to a maximum of 1GB of memory means replacing the existing memory module.

Replacing the notebook-sized hard disk or optical drive involves getting your hands dirty, but it is possible. Long-term, it's technically possible to upgrade if an appropriate board is released because the motherboard slides out from the enclosure.

Priced at just under $2,000, the Dream PC's slim workstation is competitive against similarly specced offerings from Dell, IBM, HP and other big names, even though its footprint is smaller.

ENTERTAINING POTENTIAL

For the home user, the compact PC screams "entertainment". However, the lack of a TV-out stops you from connecting the system to a big-screen TV. The onboard audio controller allows for only stereo sound, which is less than ideal for watching DVDs, even though full-screen playback is crystal-clear and smooth.

Assuming these negatives aren't too much of a drawback for the home users, we ran further tests with entertainment in mind. The Dream PC labours through two-pass video compression using XMpeg 5.0b, and some read errors slow data transfer when decoding video from DVD. But the quality of full-screen playback is high with no noticeable drop in frame rate.

The system is weaker on the gaming side. Its Intel 845G Graphics Controller drives the video subsystem, using system memory to display images. It's difficult to play most modern 3D games at an acceptable frame rate with even moderate quality settings, as verified in our benchmarking results: 1,277 in 3DMark2001 and 35.9fps under Quake III (at 1,024 x 768 x 32 bits per pixel) leave a lot to be desired when compared to some of the bare-bones systems reviewed in June's *APC*.

One improvement in this area would be to replace the onboard graphics controller with a mobile GPU, such as a Mobilty Radeon or GeForce Go. Both chipsets come with integrated TV encoders and dramatically improve 3D performance while not taking up too much landscape on the mainboard.

Jarrod Spiga

Details	
Contact	Pioneer Computers
Phone	(02) 9690 2888
Online	www.pioneer-computers.com.au
Price	$1,999
✔	Compact; specs; upgradeable.
✖	3D performance; no TV-out.
Verdict	●●●○○



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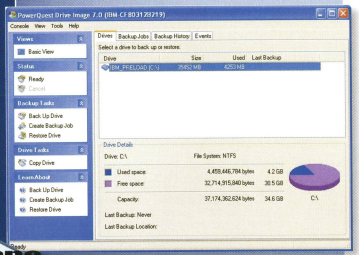
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apc EDITOR'S CHOICE AUG 2003

Daily mirror: *the ability to back up incrementally reduces imaging time.*

Bonus CD software

A trial version of Drive Image 7, plus a bonus full working version of Drive Image 5 (also see the Workshop article on page 135).

Back up in a snap

With the arrival of Drive Image 7, you've run out of excuses for losing data on your hard disk.

If you frequently reinstall your operating system, you've probably encountered disk utilities like Drive Image and Ghost. These disk-imaging tools take a snapshot of your system in its optimal configuration, making it easy to recover from a crash by restoring the image to the hard drive. Such utilities also popular with IT staff, because they make light work of rolling out a fleet of identikit PCs built and locked down to a standard corporate image.

Drive Image doesn't simply copy files on your drive: it takes a sector-by-sector image of the disk, compresses it and stores it in a single file. The entire contents of a machine can be stored in case of an emergency, or for duplicating one hard disk onto another.

PowerQuest's current Drive Image 2002 is one of the most useful programs in the *APC* lab. We test harwdare using standardised OS installations, but instead of each time arduously reinstalling Windows, we just apply a clean image file to the hard drive.

SCHEDULED BACKUP

One of the best features new to this program is the scheduled backup, which lets you take these snapshots at a regular time each day. After you've taken the first image, Drive Image tracks the changes and incrementally backs them up, substantially reducing the time taken to create each image. We were able to image a 20GB hard disk loaded with 14GB of data, and unpack it again, in under 25 minutes.

Another improvement is being able to store those images virtually anywhere. Its predecessor could back up only to an alternate partition or CDs. Now, the range of storage options includes burning backup images to DVD, sending them down a network connection to a remote machine or drive, and storing them on a portable hard disk.

APC staff are fans of external hard drives for data backup because the USB 2.0 and FireWire interfaces let them operate at speeds approaching those offered by internal drives.

A common complaint in previous versions of Drive Image was the need for a Windows machine to reboot before taking a snapshot of the drive, which is the only way to access system files which Windows usually protects from imaging. But the canny PowerQuest engineers have now managed to enable sector-level imaging under Windows. The result: no more dropping to DOS, and in turn, a substantially smoother backup process.

QUICK ACCESS WITHOUT LOADING

Another handy feature is the ability to mount a backup image as a drive letter. This means you can access files stored in backups without loading Drive Image, and it saves a lot of hassle should you accidentally trash a file.

One of Drive Image 7's negatives is that it can't be used to back up information held on a server. But that's why PowerQuest also sells a server version of it, called V2i Protector (with a $2,084 price tag), which can capture a backup image of any client machine on the network.

It works by pushing an agent down to each client which keeps track of file-level changes and sends them back to the server. The information is then rolled into a backup image file — producing exact copies of network machines in real time. If a client machine crashes, the administrator can push a backup through the network to another computer, or even mount and share the backup volume so the user can download the files needed to get up and running.

PowerQuest aggressively targets Norton Ghost customers by offering a half-price upgrade from previous versions of both Drive Image and Ghost. Drive Image 7 works only under Windows 2000 and XP, but the retail version ships with a copy of Drive Image 2002 in the box, thereby adding support for Windows 95, 98, Me and NT.

Drive Image 2002 doesn't include advanced features, such as the ability to mount a backup image or save to a network drive or an external hard disk.

But, as the image files are compatible, you can install each on a separate computer at home and share images.

Matt Overington

Details	
Contact	ACA Pacific
Phone	(02) 9922 5333
Online	www.acapacific.com.au
Price	$73.70
✔	Fast, simple backup.
✖	No dynamic disk support.
Verdict	●●●●◐

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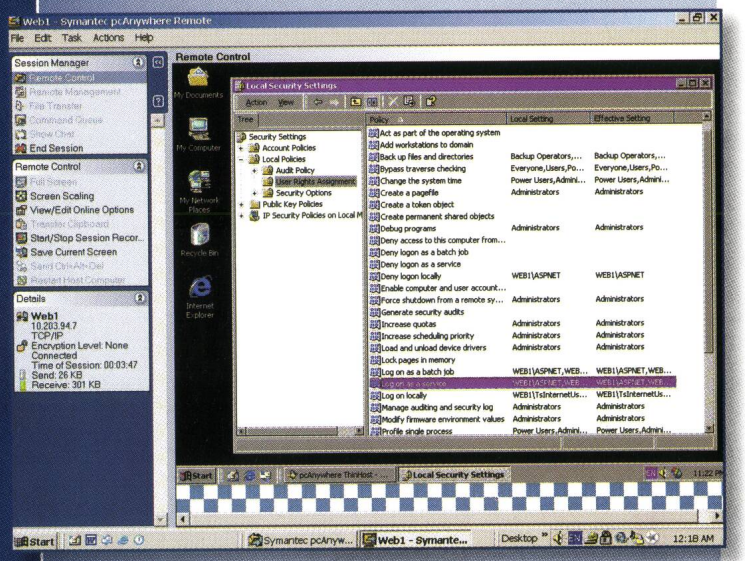
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Power by proxy: *using pcAnywhere's Quick Deploy, administrators can monitor and control networked PCs, but without requiring user consent.*

Remote possibilities

You can wield awesome administrative power, but what if this product should fall into the wrong hands?

Remote control software is an ingredient in the system administrators' recipe for slashing helpdesk support costs, especially in extensive networks with users scattered across floors, sites or even countries. The remote control champ has remained Symantec's pcAnywhere, despite the efforts of LapLink and the arrival of a Remote Desktop feature in Windows XP.

The revamped, workflow-oriented interface puts configuration at your fingertips and is a boon for supporting mobile users and telecommuters. The range of chores includes automated directory copy and file synchronisation between computers, remote GUI of the target machine, remote DOS batch transfer and control, and it has direct registry hacking tools.

While these feats are all achievable with Windows XP Professional, they often involve a maze of interrelated, sometimes complex sequences. With pcAnywhere, Symantec shows how it should have been done, and with corporate pricing as low as $80.20 per seat, it can pay for itself very quickly.

Version 11 builds on the software's concept with management tools to help get users out of trouble without the techies ever leaving their desks. The approach of pcAnywhere's peer-to-peer system is quite different from expensive, centralised enterprise management systems. This important architectural difference shows up markedly in our tests when it comes to matters of security.

PEERING AT USERS

The trouble with adding extra connectivity to an operating system's functionality is the possibility of introducing security risks. Symantec has gone to great lengths to lock down the link in claiming support for 13 different authentication types, along with "three levels of encryption, serialisation of host and remote, integrity checking, restricting access to specific IP addresses and subnets, and the ability to change the port pcAnywhere uses".

In some cases it could all be for naught. Our tests discovered a way for valid users to employ pcAnywhere's peer-to-peer model to access each other's accounts, without any specific client software being installed on the target system.

An administrator logging onto a Windows 2000 server using pcAnywhere's Quick Deploy and Connect tool can monitor, record and control the local user's session without that user's permission or even a message box informing them that activity is being monitored.

The only alert is a button that appears on the target machine's taskbar when pcAnywhere connects, but it's easily overlooked.

Even when the local user logs off, pcAnywhere's host automatically starts up when that user or a new one logs on, allowing the continuing monitoring of the session.

ACCESS ALL AREAS

The threat goes further. Any rogue user with administrator privileges can do things in another administrator's name while their monitor is off or they're out to lunch. There is the potential to circumvent a file server's normal security audits, depending on how they are set up. A false trail can be left, blaming the host admin for everything that happened, without an easy way of proving otherwise.

Symantec tech support staffers told *APC* the risks were considered acceptable because administrators can use Quick Deploy and Connect, and the whole concept of admin-level access is that admins can do anything anyway.

This *is* true, but pcAnywhere makes it possible for them to do it in *another* admin's name. And that makes a big difference. We agree with Symantec's belief that anyone with admin access could wield stealthier hacking tools from the Internet, and also that some other products in the remote control set don't even put a button in the Windows taskbar of the target PC.

But we maintain that pcAnywhere would be more welcome with admins and users if it insisted on the host's permission before a remote user could act in their name.

Our tests also found that Windows XP Professional's method of running desktop productivity apps over the wire using Windows NT4-derived Remote Display Protocols is superior to the task performed under pcAnywhere.

However, this product's file transfer abilities and remote administration win out over Windows.

If you're running an XP network, then a combination of XP's Remote Desktop for apps and pcAnywhere for admin, would be the recommendation.

Eric Wilson

Details	
Contact	Symantec
Phone	(02) 8879 1000
Online	www.symantec.com.au
Price	$329.95
✔	Remote management power; flexible deployment.
✖	Security concerns.
Verdict	●●●◐○



Three Awards in three months

APC Magazine - March 2003
The Diamond View DV172 17" TFT LCD Monitor was awarded Editor's Choice

PC Powerplay - April 2003
The Diamond Pro 2070SB 20" CRT Monitor won the Gold Award

Atomic Magazine - May 2003
The Diamond View DV172 17" TFT LCD Monitor won the Hot New Product Award

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Cobalt RaQs

model	processor	RAM	hard drive	quarterly	annual
RaQ550	1gHz	256MB	40GB	$1,649	$5,490
RaQ550	1gHz	512MB	2x80GB	$2,249	$7,490

Dell PowerEdge 1650 with Redhat Linux

model	RAM	hard drive	quarterly	annual
PIII 1.13 gHz	256MB	18GB	$2,500	$8,600
Dual PIII 1.13 gHz	512MB	2x18GB	$3,300	$11,300

Dell PowerEdge 1650 with Windows 2000

model	RAM	hard drive	quarterly	annual
PIII 1.13 gHz	256MB	18GB	$3,000	$10,200
Dual PIII 1.13 gHz	512MB	2x18GB	$4,000	$13,600

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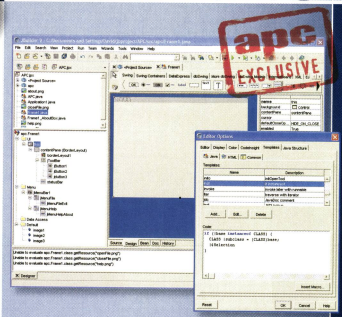
Borland's premier Java development suite expands support for project life-cycle management, but takes Java no further.

Shipping in three distinct versions — Personal, Developer and Enterprise — JBuilder 9 remains a quality integrated development environment for Java programmers.

The Developer version meets the needs of single-member and small programming teams. The free Personal edition is best suited to those wanting to experiment with Java and for standalone developers working on in-house apps. And Enterprise is good for large organisations integrating to legacy apps across a range of platforms.

Coming only six months after JBuilder 8 (see *APC* March, page 112), version 9 includes project life-cycle management technologies recently acquired by Borland, Starbase and TogetherSoft. While these enhancements assist the majority of programmers in several ways, there's no option to target the .NET platform (akin to Microsoft's J# language), and nothing to benefit end users of a generated application.

Maybe this reflects the stability of the Java language itself. But without any substantial changes to the product, we're left wondering if this release should have been tagged JBuilder 8.5 or issued as a separate "companion tools" product.



***Nine lives:** boasting improvements but no major changes, JBuilder 9 could have been tagged as version 8.5.*

NEW TOYS

One of the biggest improvements is speed. Version 8 tends to lag on machines with less than 512MB of memory, but this has been improved between releases. The Enterprise version still demands a half-gigabyte of memory, fine for most modern desktops but something to consider if coding on a notebook.

After a week of solid use, the speed and responsiveness of version 9 is obvious. This is a welcome return to the immediate feedback of early editions of JBuilder, unaffected by the version's real time code checking. Mistakes in syntax are marked up as they are entered.

JBuilder offers a small range of useful enhancements. Many, like the inclusion of more advanced framework layout tools, will appeal to IBM WebSphere Studio developers.

Javadoc, the custom Java self-documenting tool, now supports custom tags. Heading text can be specified for a custom tag and rendered in the Javadoc HTML output file followed by text associated with each use of the tag. This is good for the time-pressed programmer who leaves documentation to the last moment. By defining tags, comments are readily converted to a printable manual.

A new Show Console Output option on the Javadoc wizard allows output to be interspersed with compiler messages and other output from the build process. This aids with debugging by making clear the path of execution and method calls taken by troublesome apps.

Building on the benefits of CodeInsight — helpful pop-ups displaying code syntax — the new JavadocInsight has been introduced, aiding the entry of Javadoc tags into Javadoc comments. This can prevent formatting errors in comments, and displays automatically when the @ symbol is put in a Javadoc comment block.

Code templates containing import statements now stream into code gracefully; when invoking the template, JBuilder automatically strips out import statements and puts them at the top of the source file along with any others. Previously, this had to be done by hand, deterring the use of templates for significant bodies of code.

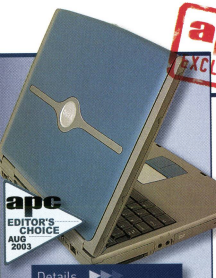
For Developer and Enterprise users, files and directories can finally be dragged and dropped from Windows Explorer into JBuilder's project pane. It's a small enhancement, but powerful in its simplicity and sure to be appreciated by those either migrating projects to JBuilder from another environment or who have non-programmers contributing to the project (such as graphic or Web page designers).

An especially welcome addition in the Enterprise version is the Web Services Console, providing direct access for testing deployed Web services. A Web service can be opened in a normal Web browser, but with the deployed services, exposed methods (operations) and service description (WSDL) all displayed and accessible for debugging.

The Web Service can be tested on the page, and XML SOAP requests and responses inspected to precisely trace the communication taking place. This would otherwise require third-party products such as XMLSPY.

David Williams

Details	
Contact	Borland Australia
Phone	1300 799 688
Online	www.borland.com.au
Price	Personal: free. Developer: $1,998; upgrade $839. Enterprise: $7,000; upgrade $2,279.
✔	Enhancements for faster documentation.
✖	No new end user features or .NET support.
Verdict	●●●●○



Desknote slayer

Dell's 3GHz Mobile Pentium 4-powered Inspiron 5150 knocks desktop-class notebooks for six.

Plenty of vendors shoehorn 3GHz desktop Pentium 4 chips into their "desknote" offerings, but Dell is among the first to adopt Intel's new Mobile Pentium 4 CPU (not to be confused with the Pentium 4 Mobile — see page 16 for more details).

The muscle-bound mobile chip sits in the same chassis as Dell's 2.8MHz P4-powered Inspiron 5100 desknote, so they're identical from the outside.

But it's what's under the bonnet that counts, and in the 5150 that means the 3.06GHz MP4 processor, double the RAM (512MB) and a Radeon 9000 GPU replacing the Radeon 7500. This compelling combo helps the 5150 hammer its P4 predecessor on every count.

The Inspiron 5150 surged ahead in processor testing, scoring a Mobile Mark performance rating of 207 against the 5100's meagre 164. Even better was battery life: 3 hours and 47 minutes under Mobile Mark, almost an hour more than the 5100.

That's a welcome result, given early industry concerns that Intel's desire to set its newest mobile CPU against the P4 desktop would significantly handicap its battery life.

But power-saving techniques such as Enhanced SpeedStep (which adjusts clock speed depending on the workload) continue to do their job. On the test bench we noticed the CPU speed dropped to around 1.6GHz during lean processing periods, and throttled all the way to the top rate as the load increased.

Does this mean the end of vendors treating the Pentium 4 as a pseudo-notebook CPU? We certainly hope so. The Mobile Pentium 4 can be configured to run with the standard 852PM chipset, and the CPU pricing is only US$16 above equivalent P4 chips, so it's easily dropped into performance-oriented desknotes.

Yes, it's a huge machine, weighing 3.6kg when loaded with the DVD drive. But that comes with the desknote territory. Armed with the Mobile Pentium 4 processor, the Inspiron 5150 delivers an uncompromising blend of performance and battery life for the power-user.

Matt Overington

Details	
Contact	Dell
Phone	1300 303 107
Online	www.dell.com.au
Price	From $3,330
Mobile Mark 2002 Battery	0 — 227min — 340
Mobile Mark 2002 Performance	0 — 207 — 300
✔	Balanced performance; battery life.
✖	Large and bulky.
Verdict	●●●●○



Caddy stack

With two removable notebook drives, the clever DynaBacker keeps your data safe and secure.

The huge amount of data residing on the average home or business PC makes backing up a seemingly insurmountable challenge. CDs are too small, and DVDs are bigger but still expensive.

But before you reach for the classic tape-drive solution, consider the DynaBacker. It's a compact unit employing a pair of 2.5in notebook drives to provide RAID 1 backup, mirroring the data at high speed to both drives. This gives a degree of integrity which single-drive backups lack.

Versatility is another key to its appeal. Each drive is fitted into a sturdy caddy, making them removable and functional as external USB 2.0 hard drives with the addition of an optional $129 adapter.

The DynaBacker comes without drives fitted, adding to the overall cost, although this means you get to choose drives according to desired size, speed and spec.

Only the IBM Travelstar drives (now sold under the Hitachi brand) are currently approved for use with this unit, due to their cool running, because the caddy provides little room for air to flow. However, any 2.5in IDE drives that run at a low temperature could be used.

Installation of the drives into the caddies is simple thanks to clear instructions. The design doesn't leave a lot of room for the caddies and they must be inserted perfectly straight.

This is another reason to check the thermal characteristics of whatever drives you choose: if they run too hot, they can cause expansion of the caddy shell and won't eject until it has cooled down.

Drive performance depends, of course, on the bus speed of your PC. We dropped in a pair of older Travelstar drives and attained transfer speeds around 400MB/min. Faster, later-model drives would gallop along.

The unit includes an informative LED display and four function buttons for entering a four-digit password to eject the drives.

The ability to act as a backup medium, redundant storage device and portable storage solution makes this a cost-effective and versatile choice for home or small business users.

Paul Robinson

Details	
Contact	MicroGram
Phone	(02) 4389 8444
Online	www.mgram.com.au
Price	$499 (USB adapter $129)
✔	Versatility.
✖	Caddy insertion/ extraction.
Verdict	●●●●○

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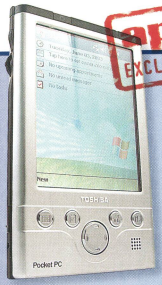
Registered business name of Fujitsu PC Asia Pacific Pte Ltd ARBN 098 263 195

Fujitsu recommends Microsoft® Windows® XP Professional for Mobile Computing

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FJT0085_P1

Toshiba e750 Pocket PC



apc EXCLUSIVE

Go speed racer

Toshiba's latest Pocket PC combines style and power in a formidable handheld package.

As Toshiba's new flagship handheld, the e750 Pocket PC has changes in all the right places while holding on to the distinctive design of the earlier e740.

The combination of the fresh-baked Windows Mobile 2003 OS (nee Pocket PC 2003) and Intel's gutsier 400MHz XScale PXA255 processor, with a 200MHz internal system bus over the previous chip's 100MHz bus, provides a noticeable speed kick.

It's also good for gaming on the go, with an ATI Imageon Graphics chip and four hardware buttons with good tactile feedback and a responsive directional pad. Multiple button presses aren't supported however, ruling out many action games.

Despite the claimed power-saving features of the PXA255, we were able to squeeze only two hours and 48 minutes out of the e750's replaceable 1,000mAh lithium ion battery at maximum drain (continuous MP3 playing in Windows Media Player, screen at full brightness).

Disabling the display more than doubled this to nearly seven hours, and battery life can be further extended by clocking down to 200MHz using the built-in CPU speed stepper.

Memory has been beefed up to an astounding 96MB (64MB of SDRAM plus 32MB of non-volatile flash RAM ideal for backups on the go).

Volume and sound quality are faultless through earphones, but the internal speaker is tinny and weak. And while the 3.8in screen is an improvement on the previous, milky panel, uneven distribution of the backlight towards the bottom of the screen mars what would otherwise be a great display.

A choice of built-in Wi-Fi or Bluetooth keeps corridor cruisers connected. Setting up a Bluetooth connection and sending files between the e750 and a laptop computer is a breeze thanks to the nifty Bluetooth utilities included in the new OS, ranging from Chat to FTP. Dual CF and SD slots cater for a wide range of peripherals, and additional memory.

It's disappointing that apart from a backup applet and some presentation tools, bonus software is largely lacking — at odds with the usual practice of bundling a large suite of software with high-end handhelds.

Jenneth Orantia

Details	
Contact	Toshiba
Phone	13 30 70
Online	www.toshiba.com.au
Price	$1,249
✔	Fast processor; ample memory; good screen.
✖	Limited battery life; bundled software.
Verdict	●●●◐○

HP Photosmart 1200

Carry on scanning

Being slipped into a notebook carrier is the only bagging this mobile scanner deserves.



HP's Photosmart 1200 portable flatbed scanner is a big improvement on its predecessor, the Photosmart 1000. Not only does it weigh less but it has more features. The tweaks should boost its appeal to the mobile crowd.

The 1200 comes with 8MB of onboard flash memory, is powered by either four AA batteries or the USB port on the PC, and is compact enough to squeeze into a notebook bag.

A handy feature lets you scan directly to Secure Digital or CompactFlash memory cards without connecting directly to a PC.

Information displayed in the LCD panel includes the amount of free space on the memory card, battery life remaining and the storage location.

Connection to Windows-based machines is straightforward and the OS automatically detects the media drives and assigns them individual drive letters. It's great if you have a digital camera or flash memory hard drive and don't want lots of USB cables.

The supplied software package includes a copy of HP Photo and Imaging Gallery, but it isn't required to transfer images to a Windows-based PC. Once the scanner is connected to a PC, it's recognised as a USB disk drive.

Images captured by the scanner simply show up as files on this virtual disk drive. Unfortunately, optical character recognition software isn't supplied.

A small flatbed area of 10 x 15cm limits the unit's application to scanning snapshots or parts of large images. The lid is removable, making larger documents easier to cope with.

A copy of Panorama Maker 3 is supplied for merging several images into one. Those wanting to scan fullsize documents will almost certainly look elsewhere because, while image stitching can be handy, it's a pain to mess around with.

The inclusion of four scan modes, memory card capabilities, an LCD panel and a choice of power modes make the Photosmart 1200 an ideal choice for people on the move.

The quality of scans is outstanding, with few chroma or visual artefacts appearing at high resolutions.

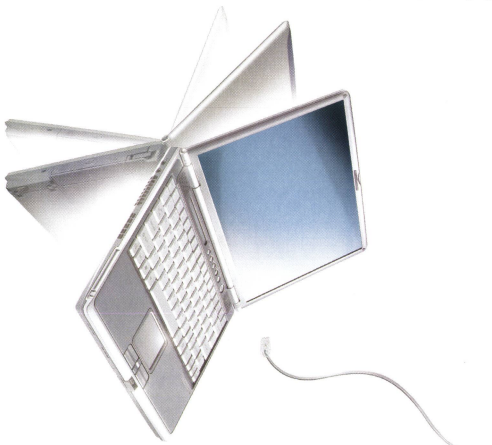
James Eke

Details	
Contact	HP Australia
Phone	13 23 47
Online	www.hp.com.au
Price	$249
✔	Simple, elegant scanning.
✖	Small platen for power users.
Verdict	●●●◐○

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NeTraverse Win4Lin 5.0

Give Linux a leg up

Compared to the vast improvements in Win4Lin 4.0, this is more like a minor release.

Linux users have long praised Win4Lin for its ability to enable Windows apps to run on the free OS. Huge functionality enhancements debuted in version 4.0, but the improvements between 4.0 and 5.0 are less noticeable.

Version 5 supports all versions of Windows up to Me — so Windows 2000 and XP applications can't be run — but it should work with most popular software packages.

There's improved video support, including DirectX functionality for players that don't require direct hardware access.

Networking support has also been revamped with the implementation of the Winsock2 standard, to improve network performance for those not using the virtual network device.

Win4Lin goes easy on resources, too, requiring a Pentium system with 64MB of RAM and 135MB of hard drive space for a complete OS install, and up to 200MB for each additional user.

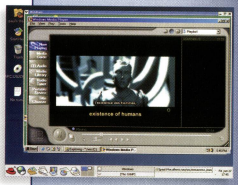
The software still supports recent distros, such as Xandros and Lindows, as well as the more established names. Requiring online registration of the licence key, it's also one of a few apps that require a reboot due to the installation of a customised 2.4 kernel.

Overall, the installation process is straightforward thanks to the easy-to-use wizard. The second stage involves installing Windows from original CDs where you'll see a speedy Windows install and fast boot times. Users of Xfree86 4.0 should take note of installation instructions or they'll be treated to blank screens due to a redraw quirk.

At $149.95 for the downloadable version, this isn't cheap — especially given the cost of a copy of Windows and apps like Office. However, compared to VMware's equivalent product's price tag of $544, Win4Lin is a more attractive option.

Owners of Win4Lin 4.0 can upgrade for $49.95, however, given that most purchase Win4Lin because it can run Office and Photoshop, there isn't much reason for version 4.0 owners to upgrade.

Paul Robinson



Details	
Contact	Everything Linux
Phone	(02) 9712 1799
Online	www.everythinglinux.com.au
Price	From $149.95
✔	Improved video and sound support.
✖	Expensive; requires reboot.
Verdict	●●●●○

Archos Jukebox Multimedia 20

Tough little customer

The first video-capable multimedia players have arrived, and this one's ideal for road warriors.

Archos has taken North America by storm with its MP3 players, in doing so challenging the Apple iPod and Creative Nomad. This tiny hardware media player — now available here — handles a wide range of functions — from storing pictures to recording and playing back MP3 files. But the biggest selling point is its ability to play MP4, XviD and DivX video files.

USB 2.0 and FireWire connections are supported, so getting media files to the drive is a snap. The Multimedia 20 supports constant and variable bit rate MP3 files, but not the OGG or WMA formats. Audio quality is outstanding and the pre-amp is loud enough to drown out ambient noise.

The 237 x 234-pixel screen is little bigger than a postage stamp — only about half the size of an iPod or Nintendo Gameboy screen — and isn't good for watching movies. We found ourselves plugging the Jukebox into televisions to watch clips longer than a few minutes.

The spec sheet boasts seven hours of playback time; the test unit averaged about five hours depending on the volume and type of file played.

A common complaint with the player is its fragile finish. Our review model came with much of the paint missing from the rear panel, and we've seen others with the same problem.

The unit is supplied with a soft carrycase, so this needn't be too much of an issue, and construction is for the most part robust. A rubber boot protects each corner.

Reasonably rough handling during playback doesn't cause skipping or jumping. Bear in mind that the unit relies on a notebook hard disk for storage, so it's not completely impervious to shock, but it can withstand a bump or two.

Camera and Flash Media reader attachments are available for converting the unit into the complete portable multimedia tool.

At about 300g, the Multimedia 20 is substantially heavier than the iPod. And it's a couple of hundred dollars more expensive.

If you want to do a little of everything on the road, the Archos unit is unbeatable. If you're looking for just an MP3 player, stick to a Nomad or iPod.

Matt Overington



Details	
Contact	I-Tech
Phone	(02) 9261 8101
Online	www.itech international.com
Price	$945
✔	Feature-packed; awesome sound.
✖	Small screen; flaky paint.
Verdict	●●●●○

Go you good thing!

From budget to blow-out, and ultra-thin to BYO wheelbarrow, we tested 50 notebooks and came up with some suprising results. *David Lin, Matt Overington, Paul Robinson* and *Jarrod Spiga* report.

If you don't already have a notebook, there's a good chance you soon will. Already overtaking desktops as the new PC purchase (especially in the consumer arena), odds are you'll be sorely tempted by the portability, power and price of the latest round of notebooks.

And the manufacturers know it. That's why they keep piling on the features, dividing the market into niches (from tablets and sub-2kg ultra-portables to hulking desktop replacements) and aggressively pitching them at distinct target markets.

Today's notebook shopping checklist comes with the boxes already ticked for a massive hard disk, Wi-Fi, CD and DVD burning . And recent developments in mobile processors mean that OEMs have an enormous choice when it comes to building up a portable platform.

Buying a notebook is always a balancing act, with factors such as size, weight, features, performance and, of course, battery life all being factored into the equation. That's why we've rounded up 50 machines from 22 vendors, spanning the entire notebook landscape.

Entrants to our annual megatest submitted units built on a half-dozen processors, ranging from the Pentium M to the desktop Pentium 4. Dell's Inspiron 5150 — the first of the new desktop slayers built on Intel's Mobile Pentium 4 "desknote" CPU — missed the cut-off for this comparison, but you can read a standalone review on page 50.

Several vendors were unable to provide review units representing their full range: Toshiba's Portege 3500 Tablet PC and IBM's super-slim ThinkPad X30 are among several notable exceptions in the field.

And just because a notebook didn't make it into this megatest, doesn't mean that it isn't worth a gander. But in that scenario, you wouldn't be able to buy with confidence in comparison to those units tested here in *APC*'s Labs for this roundup.

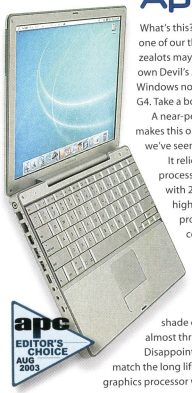
Such is the diversity and maturity of the notebook market that it's no longer a simple task to segment models into a few clear-cut categories.

To this end, we've done a bit of delineating by breaking down the market into five core classifications (see the legend right) and tagged each review with the appropriate icons, for easier reading.

Legend

- **DN Desknote** — Uses a Pentium 4 desktop CPU.
- **DR Desktop Replacement** — Big screen, solid weight and grunt.
- **UP Ultra-Portable** — Smaller footprint and sub-2kg.
- **$ Budget** — Notebooks costing less than $3,000.
- **AR All Rounder** — Mix of performance and power.

Apple PowerBook G4 12in



What's this? *APC* choosing an Apple notebook as one of our three Editor's Choice champs? Wintel zealots may recoil in horror, and we even played our own Devil's Advocate, but it came down to this: no Windows notebook is as slick as the 12in PowerBook G4. Take a bow, Apple; and everyone else, take notes.

A near-perfect blend of power, size and looks makes this one of the most compelling notebooks we've seen.

It relies on an 867MHz PowerBook G4 processor fitted with a 512KB cache, coupled with 256MB of RAM and a 40GB hard disk. The higher spec models have a slightly faster processor and 1MB of cache, providing a corresponding boost in performance.

The base config sports a combo CD-RW/DVD-ROM drive, but for 400 extra the SuperDrive adds DVD burning (using the DVD-R spec).

Battery life is impressive, averaging a shade over five hours under minimal load, and almost three hours during DVD playback.

Disappointingly, the 3D performance doesn't match the long life. Despite packing nVidia's GeForce 4 Go graphics processor with 32MB of DDR SDRAM, the Quake III tests report a middling 54.2fps. But to be fair, no-one buys Apple machines for game playing.

A Speedmark 3.2 score of 114 trails the bell-ringing 152 set by Apple's 17in PowerBook unit, but it's still considerably faster than the eMac desktop (which nudged 100).

While lacking built-in wireless, Apple offers its 802.11g-compliant AirPort Extreme card for $199, which is faster than 802.11b but still works with existing Wi-Fi networks.

The PowerBook is a marvel of design, with all the ports sensibly located and a keyboard that's comfortable to use even in cramped conditions. The trackpad makes pointer navigation a breeze, although you'll need to get used to hitting the single button with your thumb as a double-tap on the trackpad isn't registered as a mouse click.

And using Mac OS X again reminds us that sophistication, power and fun don't have to be mutually exclusive in an operating system.

Details AR

Contact	Apple
Phone	13 36 22
Online	www.apple.com.au
Price	$3,499
✔	Design and power.
✖	Relatively expensive.
Verdict	●●●●○



Acer TravelMate 803LCI XPP S

Here's a heavy-hitter in a medium-weight class. The TravelMate 803LCI XPP S is a desktop replacement machine which also pleases as an all-rounder. Weighing in at 2.5kg and sporting a 15in screen, it's a behemoth with power to burn.

The meaty spec includes a 1.6GHz Pentium M processor, 512MB of RAM and a 60GB hard disk. A 64MB ATI Mobility Radeon 9000 GPU provides outstanding video performance, even at the 1,400 x 1,050 native resolution of the 15in TFT.

The bevvy of ports serves up four USB connectors, FireWire, Ethernet, modem and a parallel printer port, plus 802.11b Wi-Fi. Our review model was configured to replace the PC Card slot with a multi-format memory card reader that accepts CF, Memory Stick and SD/MMC wafers. Bluetooth support is optional.

A trapping with definite appeal to the corporate market is the in-built smartcard reader and security software.

The notebook can be set to start only when an authenticated smartcard (two are supplied) is slipped in the reader.

The 803LCI clocks up a walloping 140fps under Quake 3, along with this roundup's highest performance rating under MobileMark 2003 and Business Winstone 2002.

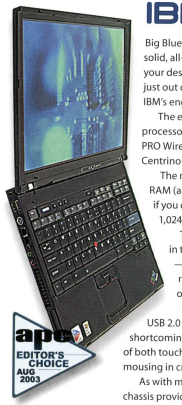
It also has great stamina. The power-saving benefits of the Intel's Pentium M processor, i855 chipset and Wi-Fi adaptor earn it the right to bear the Centrino label, and coupled with a massive 65Wh battery achieves staggering battery life. The 803LCI surpasses the five hour mark under Mobile Mark 2003 and only just falls short with the more intensive BatteryMark.

This is almost double the life of many comparable desktop replacement units, and there's enough juice to watch two DVDs. Just as well that it ships with a CD-RW/DVD combo drive in the media bay.

If you want still more miles per gallon, the drive can be swapped out for an additional battery.

All this helps mitigate a price tag that's just shy of $6,000. It's a lot of money, but the Acer 803LCI is a lot of notebook.

Details	DR	AR
Contact	Acer	
Phone	1300 366 567	
Online	www.acer.com.au	
Price	$5,799	
✔	Battery life; performance.	
✖	Cost.	
Verdict	●●●●○	



IBM ThinkPad T40

Big Blue hit the mid-point target with the T40. It's a solid, all-round performer that's capable of nudging your desktop into retirement. Weighing 2.2kg, it's only just out of contention in our subnote category — clearly, IBM's engineers did their homework on this one.

The engineroom houses a 1.5GHz Pentium M processor that's married to the i855 chipset and Intel's PRO Wireless LAN adaptor so the T40 can brandish the Centrino logo.

The rest of the roster is equally solid: 256MB of RAM (although we'd suggest you upgrade to 512MB if you can afford it), a 40GB hard disk and a 14.1in, 1,024 x 768 pixel screen.

The T40 is also one of only half a dozen units in this selection which includes Gigabit Ethernet — a definite bonus if your office is already running Gigabit, or if high-speed networking is on the cards.

It also has dual PC Card slots, although the two USB 2.0 connectors and lack of a FireWire adaptor are shortcomings you might want to consider. The inclusion of both touchpad and pointer stick provides flexibility for mousing in cramped conditions.

As with most ThinkPads, the magnesium and titanium chassis provides sturdy support for the screen and internals, as well as encouraging cooling. Heat is an issue with many notebooks, but the T40 remains comfortable for long sessions on the train or couch.

The power-saving enhancements of the Centrino platform stretch the T40's battery life to four-and-a-half hours under Mobile Mark 2002, placing it near the top of the chart in this challenge. The stamina isn't at the expense of processing power however, as the T40 clocks up a Winstone 2002 score of 25.7, and follows through with 155 under Mobile Mark.

Gaming results aren't stellar, but the 3DMark score of 4,004 and 80.3fps under Quake III proves that the T40 is a capable performer.

DVD playback is clear and jitter-free, and the S-Video port allows connection to TV set or projector.

Power, performance and understated style: it's a winning formula.

Details	DR	AR
Contact	IBM Australia	
Phone	1800 815 154	
Online	www.ibm.com.au	
Price	$4,199	
✔	Gigabit Ethernet; battery life.	
✖	No FireWire.	
Verdict	●●●●○	



Acer Aspire 1703SC

This entry from Acer's Aspire 1700 series is a big yet budget-minded brute, with a 2.66GHz Pentium 4 desktop chip placing it squarely in the desknote class.

The 1703SC weighs 6.4kg without a battery, which is an optional extra because the standard configuration presents the 1703SC as a battery-free workstation.

In fact, it's difficult to imagine why anyone wants to extend the desknote concept to such extremes. Many of the small form factor desktop machines weigh less and are considerably smaller.

In its favour, the Aspire's 17in screen gives an enormous work area, while the native resolution of 1,280 x 1,024 pixels makes the most of the screen real estate.

It's also a zippy performer, well-specced with 512MB of RAM and a 60GB hard disk, although it struggled under 3DMark2001 in scoring less than 1,000.

This machine hits the mark for performance and price, just don't plan to carry it too much.

Details	
	DN $
Contact	Acer
Phone	1300 366 567
Online	www.acer.com.au
Price	$2,999
✔	Big keyboard with numeric keypad.
✖	Very heavy.
Verdict	●●○○○



Acer TravelMate 234XC XPH S

Suitable for students or those on a budget, this notebook is hardly a rocket but, considering the specs, it performs reasonably well.

A Mobile Celeron 2.2GHz processor sits at the core of the engine room, supported by 256MB of SDRAM. The 20GB hard disk drive is a bit on the meagre side, and Acer doesn't offer larger drives as an option.

The standard keyboard layout is easy to work on, while the trackpad's vertical scroller and the four application launch buttons simplify navigation.

The 14.1in screen runs at a native resolution of 1,024 x 768 pixels — the current base-standard for notebook panels.

On the outside, a fixed CD-RW/DVD combo drive and floppy drive handle external storage needs. Two USB 2.0 ports are included, however a serial connection is noticeably absent, while Bluetooth and 802.11b wireless Ethernet adaptors are optional.

Unfortunately, you can't check the battery's charge level without turning on the notebook.

Details	
	DR $
Contact	Acer
Phone	1300 366 567
Online	www.acer.com.au
Price	$2,399
✔	Good value.
✖	Small hard disk.
Verdict	●●◐○○



Acer TravelMate 655LCi

Acer tossed almost everything into the pot when cooking up its flagship corporate model. The Pentium 4-M powerplant, running at 2.4GHz, is coupled with 512MB of RAM. However, the 655LCi achieved modest benchmark scores.

A 32MB ATI Mobility 7500 graphic processor drives the 1,400 x 1,050 pixel, 15in display at an adequate rate for enjoying a DVD or some light gaming requirements.

There's a 40GB hard disk and CD-RW/DVD drive. The latter is fitted in a removable drive bay so it's easily swapped for a cheaper DVD-only drive or a second 40GB hard disk.

802.11b Wi-Fi and 10/100 Ethernet are built in, with Bluetooth appearing on the options list.

The laptop also includes a four-in-one flash card reader and, for added security, a smartcard reader.

Ports abound; the 655 features four USB 2.0 sockets, a single FireWire port, S-Video out, a parallel connector and standard VGA D-sub.

Details	
	DR AR
Contact	Acer
Phone	1300 366 567
Online	www.acer.com.au
Price	$4,999
✔	Ergonomic keyboard; flash card reader.
✖	Overheating.
Verdict	●●●○○



Acer TravelMate C110TCi XPT

The TravelMate C110 is a full-featured tablet with a twist. It has a notebook keyboard and trackpad, a reversible screen, and it's fully Centrino-kitted with a 900MHz Pentium M CPU and wireless gadgets.

A tiny 10.4in LCD makes for cramped viewing, but the whole tablet weighs just 1.45kg (surprising when you consider the C110 lacks for nothing in functionality over a larger machine).

The most discernible feature is the swivelling screen. Pop out two lugs and the screen is free to rotate on its east-west axis and rest as a tablet, obscuring the keyboard.

It's an ingenious arrangement but not unique. Other vendors have offered similar designs, although not in a package as elegant as this.

The wireless capability is a perfect match for this sort of device and its application isn't restricted to vertical markets because the built-in keyboard and trackpad make it as easy to use as a regular notebook.

Details	
	UP
Contact	Acer
Phone	1300 366 567
Online	www.acer.com.au
Price	$4,499
✔	Swivelling screen.
✖	Pricey.
Verdict	●●●●○



AOpen 1547

Inside AOpen's 1547 you'll find a pretty hefty spec set. There's a 2.4GHz Pentium 4-M, 512MB of RAM and a whopping 60GB hard disk, which is the largest drive seen in this Labs Challenge. Only a few other notebooks sported a 60GB drive, while the average was 30-40GB, while some copped out with only 20GB.

Connectivity spans the standard set of modem, Ethernet and USB ports to include a FireWire port. Wi-Fi is optional.

The 82855 graphics controller provides acceptable 3D performance and helped the system achieve a Quake III score of 56.9fps.

However, gamers would be better off with a notebook sporting a dedicated video chipset.

Our test unit managed almost three hours under battery testing, placing it in the mid-range.

The SD card slot makes sense if your digtial camera or PDA uses SD media, and playing CDs while the unit's turned off should appeal to the student market.

Overall, AOpen's 1547 is nicely-priced, well-specced and suitable for general office work as well as kicking back with a DVD.

Details	DR AR
Contact	BlueChip IT
Phone	(02) 8745 8400
Online	www.bluechipit.com.au
Price	$3,299
✔	60GB hard drive.
✖	Could do with a dedicated video chipset.
Verdict	●●●●○



Apple PowerBook G4 17in

One of the most full-featured portables we've seen, Apple's 3.2kg, 17in über-notebook proves that power and style can work together seamlessly. The 1GHz PowerBook G4 CPU is fitted with a 1MB cache, 512MB of RAM and a generous 60GB hard disk.

You also get Gigabit Ethernet, FireWire 800, 802.11g wireless and a DVD-burning SuperDrive.

The massive screen runs at a native resolution of 1,440 x 900 pixels in a 16:10 aspect ratio (great for watching DVDs or working on large spreadsheets). The keyboard is lit from below and adjusts according to ambient light, as does the screen's backlight.

A GeForce4 440 mobile graphics processor helps the G4 to 98.6fps under Quake III. While not close to Wintel-based units, it's still nearly double the rate of the 12in version (even though it's also close to twice the price).

A Speedmark score of 152 set the Labs record as the fastest Apple notebook we've seen. Battery rundown time of two hours and 23 minutes under DVD playback was reasonable.

Details	DR AR
Contact	Apple
Phone	13 36 22
Online	www.apple.com.au
Price	$6,299
✔	Stylish; powerful.
✖	Expensive.
Verdict	●●●●◐



ASUS L3500D

At a back-breaking 3.3kg and with battery life barely managing 2.5 hours, the ASUS L3500D would best be considered in the desktop replacement category. The inclusion of a carry bag is therefore a mark of optimism!

The sub-par results of 18.7 in Business Winstone 2002 and 21.7 in Winstone Multimedia Content Creation were lower than we expected from the Athlon XP-M 2000+ CPU, but on target for a notebook at this pricepoint.

The 15in screen displays at 1,024 x 768, and is powered by the graphics controller embedded in the Si5740 chipset. The controller steals up to 32MB of the 256MB of available system memory, pushing graphics performance into the lower range.

The nicest feature is its ability to play audio CDs in the fixed drive even if the laptop is off. This could suit students who rely on their notebook for a range of functions.

But because of its weight, the L3500D is a nightmare to cart around.

Details	DR $
Contact	Cassa
Phone	(07) 3256 1999
Online	www.cassa.com.au
Price	$2,365
✔	Plays CDs when switched off.
✖	Heavy weight; weak battery life.
Verdict	●●○○○

How We Tested

This roundup mapped three main components (benchmarked performance, features and price) to come up with the best overall value. That's why Apple's 12in PowerBook, Acer's TravelMate 803LCI and IBM's ThinkPad T40 all came out on top.

We cranked each portable through our standard suite of benchmarks to obtain a solid set of numbers and performance data. Business Winstone 2002, Multimedia Content Creation Winstone 2003, WinBench 99, PCMark2002 Sandra, 3DMark2001 Pro and Quake III Arena are all used extensively, along with Speedmark for the MacOS.

Battery life is tested using both Mobile Mark and BatteryMark, with one conditioning run before we test the rundown time.

While each unit is benchmarked over several days, it's important to stress that high scores aren't everything. A sensibly-designed notebook with extras like FireWire and built-in wireless is obviously a better buy than a similarly-priced notebook that is without them.

Also, as notebooks are subjected to bumps, thumps and much stress in day-to-day life, we closely examined the build quality. Thankfully, the dark old days of shoddy notebook design seem to have passed, with heat dissipation being just one concern.



ASUS M2400

Although it has system specifications similar to ASUS's lower-priced L3500D, except for the 2GHz Pentium 4-M, the M2400 performed better under our performance and battery-life tests.

The VGA controller embedded in the SiS650 chipset powers the 14.1in display, as a result, less than the installed 256MB of RAM is available to the system.

This gave an inadequate frame rate of 21fps under Quake III, but DVD playback through the combo drive was bearable.

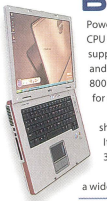
The unique industrial design may go some way to explain our difficulties in removing drives from the media bay.

However, that same attribute does make the M2400 look very different from the competition. It has a tough silver top and a dark, translucent keyboard.

The keyboard plays host to four application launch keys and a sturdy trackpad with scroll buttons.

This model won't set speed records, but it goes a long way on a tight budget.

Details	
	DR $
Contact	Cassa
Phone	(07) 3256 1999
Online	www.cassa.com.au
Price	$2,805
✔	Plays CDs when switched off.
✖	Performance; difficult to remove media from bay.
Verdict	●●●◐○



BenQ Joybook 8000

Powered with a 1.8GHz Pentium 4-M CPU with 256MB DDR SDRAM — and supplemented by a fixed DVD/CD-RW drive and 30GB hard disk drive — the Joybook 8000 is good for gaming but not so strong for everyday applications.

With Ethernet, 56K modem and no shortage of ports, it's feature-heavy. It's also physically heavy, just topping 3.25kg.

Underneath the attractive exterior, a wide-aspect 15.2in screen displays the uncommon resolution of 1,280 x 854 pixels.

The nVidia GeForce4 420 Go GPU with 32MB of RAM provides adequate performance for gaming and DVD playback, reaching over 100fps in our Quake III Arena tests.

Ergonomically, the Joybook is a pleasure to use. The keyboard is full-sized and the touchpad sits directly between your hands while you're typing your work.

The touchpad also acts as a window scroller, though occasionally this can be more of a hindrance as it's sensitive to the lightest touch.

Details	
	DR
Contact	BenQ
Phone	(02) 9714 6800
Online	www.benq.com.au
Price	$3,999
✔	Ergonomics; gaming performance.
✖	A little heavy and bulky.
Verdict	●●●◐○



Dell Inspiron 500m

The 500m we tested was supplied with a 1.4MHz Pentium M CPU, although Dell later advised that only 1.3 and 1.5MHz versions of the chip would be offered in the configuration.

The 256MB of RAM was enough for this model to achieve a very good MobileMark rating of 155. Combined with just over three hours of battery life and a weight of 2.6kg, it's a good recipe for portability.

Being driven by the controller embedded in the i855 chipset means that up to 32MB of RAM is stolen to achieve a still-low 48.5fps in Quake III.

The standard outfit includes Ethernet, 56K modem, two USB 2.0 ports, serial and parallel ports and a single PC Card slot. Our review unit also included a 30GB hard disk drive, a removable 8x DVD-ROM and a Dell TrueMobile 802.11g wireless Ethernet adaptor.

The keyboard is comfortable to use, as all keys are standard size. Unfortunately, the trackpad lacks scroll buttons or wheels.

Details	
	DR $ AR
Contact	Dell
Phone	1300 303 107
Online	www.dell.com.au
Price	1300MHz $2,530 1500MHz $3,083
✔	Good value.
✖	30GB hard drive
Verdict	●●●◐○



Dell Inspiron 5100

Dell's Inspiron notebooks are designed to blend standalone performance together with mobility.

Some would argue that lugging around 3.5kg of notebook for barely three hours of battery life is a long way from the concept of mobility. That's true, although in the context of this being a transportable desknote machine, the 5100 stands up fairly well.

The system heats up, but so do the benchmark results, with raw performance on tap due to the 2.8GHz Pentium 4 desktop processor and 512MB of RAM. This delivered 164 in MobileMark and 25.8 in Winstone.

The ATI Radeon Mobility 7500 GPU displays 1,400 x 1,050 pixel resolution on the 15in screen, to serve up a respectable 3,792 3D Marks.

Fit-outs include a PC Card slot, two USB ports and a FireWire port, a 56K modem and Ethernet. A parallel port is missing, which is disappointing for a notebook that's expected to serve as your desktop.

Details	
	DR AR
Contact	Dell
Phone	1300 303 107
Online	www.dell.com.au
Price	$3,199
✔	Application performance.
✖	Weight; no parallel port.
Verdict	●●◐○○

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Dell Inspiron 8500

The Inspiron 8500 has more features than its 5100 counterpart, shipping with a 15.4in wide-aspect screen that has a 1,680 x 1,050 resolution, so it's perfect for DVD playback.

The inclusion of an nVidia GeForce4 4200 Go GPU also provides an additional 12.5fps over the 5100 playing Quake III. It also weighs less, nudging the scales just under 3kg.

The 8500 is powered by a 2.4GHz Pentium 4-M processor mated to 512MB of RAM and a 40GB hard disk. But for all that, it only managed 16.2 under Business Winstone 2002.

It packs a full array of connectivity, from Ethernet and Wi-Fi networking to USB 2.0 and FireWire ports, plus serial and parallel. Bluetooth is optional.

The media bay has a removable CD-RW/DVD drive and can accommodate alternate optical drives or an additional battery.

We squeezed 3.5 hours out of the battery and appreciated the charge-level indicator which reports how much charge remains even when the system is off.

Details	
	DR
Contact	Dell
Phone	1300 303 107
Online	www.dell.com.au
Price	$3,699
✔	Hi-res wide screen.
✖	Application performance.
Verdict	●●●●◐○



Dell Latitude D400

Dell's smallest offering packs the punch of a 1.4GHz Pentium M processor, 512MB DDR SDRAM and a 60GB hard disk drive, which is as big as they come for notebooks.

To keep its weight down to 1.7kg, the D400 foregoes a built-in optical drive. Instead, a supplied external media module bay allows you to attach a bundled optical drive or an optional second hard disk drive.

A smartcard adaptor allows only those with a recognised card to access the machine.

The D400 has all the modern standards, including Gigabit Ethernet, 802.11g wireless plus Bluetooth and a v.92 56K modem, which supports call-waiting while you're online.

The 12.1in screen displays at 1,024 x 768 pixels, but the i855GM chipset with its onboard controller and shared system memory doesn't render 3D graphics very well, scoring a slighly under par 1,866 3DMark.

Application performance is more pleasing, at 150 in MobileMark. The battery test under MobileMark ran for just under three hours.

Details	
	UP AR
Contact	Dell
Phone	1300 303 107
Online	www.dell.com.au
Price	$4,659
✔	Compact; light; 60GB hard drive.
✖	Average 3D performance.
Verdict	●●●◐○



Dell Latitude D500

Lacking the portability of the D400 and graphics grunt of the D800, it's no surprise that the D500 is significantly cheaper than Dell's other Latitude D models.

Driving the system is an Intel Pentium M 1.3GHz CPU and 512MB DDR SDRAM — a combination that gave this notebook an edge in our application-based testing.

Like the D400, this system struggles in the graphics area. The GPU is embedded in the i855GM chipset, and it uses system memory to contain the image destined for the screen. As a result of this, its gaming and 3D benchmark results are significantly below average at 1,897.

Weighing in at 2.17kg, the D500 lacks a FireWire port, but peripherals can still be connected via the USB 2.0, PC Card, serial and parallel ports.

And just like the other Dell models, the media bay accepts several types of drives — such as the CD-RW/DVD drive which is included in this excellent price.

Details	
	DR AR
Contact	Dell
Phone	1300 303 107
Online	www.dell.com.au
Price	$3,459
✔	Good value; lightweight.
✖	Poor graphics.
Verdict	●●●●○



Dell Latitude D800

This desktop replacement was recently featured in *APC* (June, page 54). Its 15.4in LCD screen runs at a native resolution of 1,920 x 1,200 at a 16:9 aspect ratio, which is great for watching DVDs (it reduces the letterbox effect).

A 32MB nVidia GeForce4 4200 Go GPU gave adequate gaming performance, with a test tally of over 4,000 3DMarks.

Gigabit Ethernet and 802.11g wireless enable top-rate networking speed that matches the application performance provided by the 1.6GHz Pentium M processor and 512MB of RAM.

This unit ships with a removable CD-RW/DVD drive, but other optical drives, a second hard disk or a second battery can be installed in this modular port. Not that you'll need the latter — the system battery keeps the machine operating for close to four hours.

The keyboard has full-sized keys and both touchpad and stick for controlling the pointer.

As with the D400, the D800 also includes a smartcard reader for the security conscious.

Details	
	DR AR
Contact	Dell
Phone	1300 303 107
Online	www.dell.com.au
Price	$5,162
✔	High-res widescreen; smartcard security.
✖	Expensive.
Verdict	●●●●○

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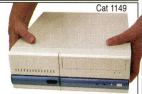


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Digital Star Powernote CQ12-15

The Powernote CQ12-15 system packs the punch of a 3.06GHz Pentium 4 desktop processor combined with 512MB of DDR RAM.

An impressive Winstone Multimedia Content Creation score of 36.8 is achieved thanks to this combo, but the desktop CPU deeply drinks the battery. The best we could get was just over 1.5 hours on a single charge.

The keys are full-size and the trackpad has a four-way scroll key. The front fascia hosts CD audio controls that enable audio playback even when the system is switched off.

The 15in screen and ATI Mobility Radeon 7500 GPU display at a native resolution of 1,400 x 1,050 pixels.

Results from 3D gaming tests were slightly above average, although a better GPU would dramatically improve performance.

An integrated Ethernet adaptor, 56K modem, FireWire and three USB 2.0 ports assist with connectivity.

Considering this system's CPU, it's surprisingly quiet, although it can get moderately warm on your lap.

Details	
	DR
Contact	Digital Star
Phone	(02) 8748 6888
Online	www.digitalstar.com.au
Price	$3,099
✔	Low-priced power.
✖	Poor battery life.
Verdict	●●●○○



Fujitsu Lifebook C2210

Best suited to those looking for a portable replacement for their desktop PC, the Fujitsu C2210 is powered by a Pentium 4-M 1.8GHz CPU, with a 40GB hard drive and a 15in display.

As this model isn't designed for long computing sessions on the road, and the insulation of other Lifebook models is sorely missing, it does get pretty warm when used to its full battery capacity.

The C2210 features four USB ports, Ethernet and parallel connections, and a card reader that supports Sony Memory Stick and SmartMedia formats.

However, with a Business Winstone score of 17.1, performance was similar to Celeron-powered notebooks.

With less than optimal performance, and a weight of 3.6kg, the C2210 is overpriced for the power it delivers.

Considering the Fujitsu E2010 is $900 cheaper, lighter and a better performer, it's debatable whether the C2210's larger screen and hard drive are worth the extra money.

Details	
	DR
Contact	Fujitsu
Phone	1800 288 283
Online	www.fujitsu.com.au
Price	$4,699
✔	Expandability.
✖	Expensive; heavy.
Verdict	●●●◐○



Fujitsu Lifebook E2010

This is the budget model of Fujitsu's flagship E series. While the case design is identical to the E2010 and the E4010, the similarities end there. The E2010 ships with a 14.1in screen (instead of the E4010's 15in offering) and a Pentium 4-M 2GHz CPU.

The lack of a Pentium M processor reflects in its battery life, with testing revealing a life of just over two hours.

The E2010 ships with only 256MB of RAM and a 30GB hard drive, both less than the E4010.

Benchmark results were disappointing, only manging a MobileMark rating of 118. Several lower-priced notebooks outperformed the E2010 under Winstone 2002.

The engineering sample tested sported a 2.4GHz P4-M processor and a stingy 20GB hard drive, so expect around a 20% drop in its already soft scores but 50% more storage space in the model you'll see on the shelves.

Four customisable keys provide easy loading of often used programs, and the external USB floppy drive saves on weight and space.

Details	
	DR
Contact	Fujitsu
Phone	1800 288 283
Online	www.fujitsu.com.au
Price	$3,799
✔	Affordable.
✖	Battery life.
Verdict	●●●○○



Fujitsu Lifebook E4010

This notebook sits at the top of Fujitsu's E series. Bearing the Centrino moniker, it delivers 802.11b networking to complement the standard Ethernet port.

The E4010 is in the final stages of testing, so the review model was an engineering sample that differed slightly to the production model.

The E4010 will ship with a 1.6GHz Pentium M CPU instead of the supplied 1.4GHz, and RAM and drive space will double to 512MB and 60GB respectively.

Even so, the demo unit provided respectable results of 23.8 for Business Winstone 2002 and 5,410 for Business Disk WinMark.

Battery life was close to Fujitsu's rating of 3.5 hours.

It's reassuring that Fujitsu has felt insulating over areas of the underside that produce the most heat (the CPU and exhaust vent, for instance).

The hefty price tag puts the E4010 out of the reach of budget-minded buyers, but it would make an outstanding corporate buy.

Details	
	DR AR
Contact	Fujitsu
Phone	1800 288 283
Online	www.fujitsu.com.au
Price	$5,999
✔	15in screen.
✖	Expensive.
Verdict	●●●○○



Fujitsu Lifebook S6120

The Fujitsu S6120 looks like a miniature version of an E series, and is the ultra-portable model of the Lifebook range. This 1.6GHz Pentium M notebook weighs in at 1.75kg and includes 802.11b wireless, Bluetooth and FireWire as well as USB.

The S6120's small size doesn't equate to less grunt, with the S6120 outperforming the rest of the Lifebook range. With a Winstone 2002 score of 26 and a Mobile Mark at 176, its speed is around 10% faster than the identically priced E4010.

At just over 2.5 hours, battery performance was a concern — about an hour less than advertised (although it must be remembered that we were testing an engineering sample).

We were taken aback by the amount of noise the S6120 generated. From what we've seen of Fujitsu notebooks this is out of character, but it may also be an issue that's fixed before the final models roll off the production line.

Portability and compactness don't come cheaply: the S6120 sits at the expensive end of the market.

Details ▶▶▶	
	UP AR
Contact	Fujitsu
Phone	1800 288 283
Online	www.fujitsu.com.au
Price	$5,999
✔	Lightweight.
✖	Expensive; noisy.
Verdict	●●●●○



Hi-Grade Notino 4400

The Notino's chunky appearance hints at the grunt within. The 2.2GHz Pentium 4-M processor and 256MB of RAM at the core of the review unit achieved a mediocre 18.5 under Business Winstone 2003.

Performance was nothing special, but then, speed isn't the highest priority when looking for a budget notebook. However, the 20GB hard drive is much less than you'd expect, even with the relatively low price.

The Notino lasted 25 minutes beyond Hi-Grade's rated 2.5-hour capacity, making it suitable for lengthy sessions away from the comfort of a 240V wall socket.

This notebook comes with an uncommon slot-loading DVD/CD-RW combo drive, along with a floppy drive and S-Video output. Buyers can spec-in the optional Wi-Fi adaptor.

The Notino tips the scales at around 3.2kg, so it's not the lightest notebook around, but this can be forgiven due to the price tag.

In all, it's a well-rounded package at a decent price, and worth considering if you're on a tight budget.

Details ▶▶▶	
	$ DR
Contact	Hi-Grade
Phone	1800 770 550
Online	www.higrade.com.au
Price	$2,495
✔	Packed with features.
✖	Small hard disk.
Verdict	●●○○○



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Hi-Grade Notino C1000

Hi-Grade's ultra-portable contender packs power and expandability into a 2.2kg package. This minimalist unit is based on a 1.6GHz Pentium M processor and features the full Centrino configuration.

Performance was respectable, with the third highest MobileMark score of 173 and an equally impressive Winstone rating of 26.3. Graphics performance was lacking, at only 48fps under Quake III.

Along with the industry-standard Ethernet jack, the C1000 also sports 802.11b wireless, and a massive 60GB hard drive. The three rear-mounted USB ports and single FireWire port should negate the need to buy expansion cards.

The C1000 suits either an office or educational setting, but its 4.5-hour battery life and connectivity options should appeal to users wanting plenty of juice on tap.

Most modern notebooks are equipped with bulky, noisy cooling systems, but the C1000 is whisper-quiet and emits a barely noticeable hum from the exhaust fan.

Details	DR AR
Contact	Hi-Grade
Phone	1800 770 550
Online	www.higrade.com.au
Price	$3,595
✔	Weight; battery life.
✖	Poor graphics performance.
Verdict	●●●●○



Hi-Grade Notino W6700

With a metallic finish, translucent white keyboard, blue LEDs and a wide screen, you'd be forgiven for thinking this was an Apple PowerBook.

Looks aside, there's a 2.5GHz Pentium 4-M processor matched to 1GB of RAM and a 60GB hard disk.

The 15.2in wide-screen display is perfect for watching movies in a 16:9 ratio, but runs at an unorthodox native resolution of 1,280 x 854 pixels — making it difficult to configure for full-screen apps.

The W6700 weighs less than 3kg, so even though it's a little bulky, it's no back-breaker.

It achieves a battery rundown time of two hours and 40 minutes — adequate for watching most DVDs but a tad short for the truly demanding mobile user.

The W6700 is clearly designed for running hefty graphics applications. Although the system and battery benchmark scores were so-so, 3D performance in Quake III was excellent, averaging 135.5fps (just 10% below this roundup's fastest notebook).

Details	DR
Contact	Hi-Grade
Phone	1800 770 550
Online	www.higrade.com.au
Price	$4,595
✔	3D performance.
✖	Heavy.
Verdict	●●●○○



HP Evo N610c

HP's Evo series — originally bearing the Compaq badge — is aimed at the business sector. A 2GHz Pentium 4-M processor and 256MB of RAM head up the spec sheet, coupled with a 40GB hard disk and a Radeon 7500 graphics chip.

The benchmarking results reflect the target market, and the Evo performs well under business and productivity applications. A respectable 21.6 under Business Winstone 2002 and 3.5 hours of battery life proved that HP has the smarts when it comes to designing work-oriented notebooks.

Noteworthy 3D performance was an unexpected and pleasant surprise, averaging a shade over 68fps in Quake III testing.

While only fitted with two USB 2.0 ports, its capacity for expansion is reasonable because of the less than common pair of PC Card slots.

The only notebook in this roundup that still ships with Windows 2000 (XP is optional), this is a decent offering for business, however the price is a bit steep for what's on offer.

Details	DR
Contact	HP
Phone	1300 305 018
Online	www.hp.com.au
Price	$4,295
✔	Great performance.
✖	Expensive.
Verdict	●●●◐○



IBM ThinkPad G40

The G40 is IBM's first stab at a desknote machine, and while it's a decent effort there's still some work to be done.

The engineroom sports a 3.06GHz Pentium 4 desktop processor, 256MB of RAM and a 40GB hard disk. This spec set should have made the G40 a rocket, but our labs testing proved it to be more a paper plane.

The G40 limped behind Centrino and Pentium III-M systems relying on processors running at half the P4's clock speed, and it struggled to achieve even a mid-range Business Winstone 2002 score of 20.5.

The video results were also disappointing, with a paltry 33.8fps in Quake III and a 3DMark score of 1,389.

IBM did pick up a brownie point for the battery life, which at 2.5 hours under MobileMark exceeded the vendor's spec by 30 minutes.

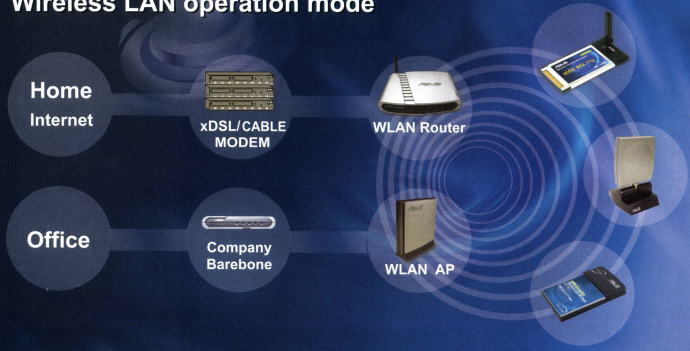
At 4.04kg, the G40 is second-heaviest behind the Acer Aspire 1700, and the heat streaming off the desktop CPU generates is enough to keep this laptop off any lap.

Details	On
Contact	IBM Australia
Phone	1800 815 154
Online	www.ibm.com.au
Price	$3,498
✔	Hi-res 15in screen.
✖	Poor performance; heat
Verdict	●●●○○

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Sony VAIO PCG-V505GSP

Sony's only entry is the Vaio PCG-V505. It boasts a 2.2GHz Pentium 4-M processor, 512MB of RAM and a 40GB hard disk.

Although a 1.8GHz version of the V505 won an *APC* Labs Challenge in May 2003, notebook technology has left it behind. The V505 relies on an i845MP chipset, and doesn't feature the advanced power saving technology found in the Centrino-class models. As a result, it fell short of three hours under MobileMark battery testing and only managed 22.4 under Business Winstone 2002, placing it around the mean on both the power and performance scales.

3D benchmarks were also mid-level, with the Vaio falling short of 1500 points under 3DMark 2001.

While the V505 was once the champion of the ultralights, it doesn't stand out amongst the current generation of sub-2kg performers, and does little to justify its hefty price tag.

Details	
	UP
Contact	Sony Australia
Phone	1300 137 669
Online	www.sony.com.au/vaio
Price	$3,999
✔	Small form factor.
✖	Overpriced.
Verdict	●●●○○



IPEX Companion

With its 1.6GHz Pentium M processor and 512MB of RAM, the Companion provides plenty of grunt for business users with a relatively low price. It enjoys the full Centrino treatment and benefits from wireless LAN support, lengthy battery life and reasonable processing power.

The Winstone 2002 score of 29 was the second-highest in this roundup, and at 2.2kg it's certainly shoulder-friendly. It's no slouch in the battery stakes either, with a run-down time just shy of four hours.

Unfortunately, its 3D performance didn't match the Travelmate 803's, but the IPEX unit relies on Intel's 855 graphics chipset instead of a dedicated chip.

The Companion hasn't abandoned support for legacy ports: serial and parallel connectors alongside four USB 2.0 ports and a FireWire socket are in this highly expandable notebook.

For business users, the Companion offers similar performance to the Acer TravelMate 803 for half the cost. But if 3D performance is critical, consider other options.

Details	
	DN $ AR
Contact	IPEX
Phone	(03) 9242 5000
Online	www.ipex.com.au
Price	$2,700
✔	Performance and battery life.
✖	Average graphics performance.
Verdict	●●●●○



IPEX Dualine

The Dualine is a desknote design gone astray. Its bulk is par for the course, even with the absence of a battery in favour of a cumbersome external battery module

And while most desknotes favour a Pentium 4 processor, IPEX opted for the desktop Celeronto to keep the price in check. This has also crippled the machine, which could only muster 16.4 under Business Winstone 2002.

Battery life wasn't much better, topping out at two hours and 25 minutes.

The Dualine does have some good features though. The 15in 1,024 x 768 pixel screen provides ample real estate, and the 40GB drive is good enough for most punters.

Dual FireWire ports and a four-in-one card reader show that IPEX has put some thought into this unit, just not quite enough.

The biggest problem is that the company has cut too many corners. Drop a decent Pentium 4 processor or the new Mobile Pentium 4 into the Dualine and it would benchmark faster, but for now it's a false economy.

Details	
	DN $
Contact	IPEX
Phone	(03) 9242 5000
Online	www.ipex.com.au
Price	$2,150
✔	Expandability.
✖	Bulky; underpowered.
Verdict	●●○○○



ITC Centris 1150L

ITC's only entry in this roundup has a good blend of processing power and battery life at an affordable price.

With a 2.66GHz Pentium 4-M and 512MB of RAM under the bonnet, the Centris is specced to perform.

Initially we had concerns with the battery life. Most Pentium 4-M-based machines fail to impress, with some keeling over in less than two hours. The Centris managed to nudge over the 3-hour mark, which would be ample for most users.

The system did well in business applications with a Winstone 2002 score of 25.6 outperforming the IBM G40 3GHz system. However, the SIS650 graphics chipset drew an average of only 25.4fps in Quake III tests.

One area of particular concern is heat dissipation. Predictably, the underside gets a bit toasty warm, but the keyboard and trackpad areas heat up much more than on most other notebooks. The Centris becomes quite uncomfortable to work on, which certainly diminishes its appeal.

Details	
	DN $
Contact	ITC Mobile Computing
Phone	(08) 94867166
Online	www.itchannel.net.au
Price	$2,699
✔	Battery life.
✖	Heat.
Verdict	●●●○○

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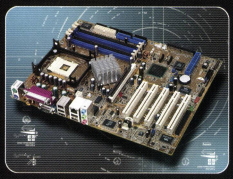
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-Randy Wilhelm, VP and GM of Intel Chipset Division

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MicroPro D400S

Clevo manufactures the MicroPro D400S and its doppelgänger, the Pioneer D400E. Instead of the 3GHz Pentium 4 processor found in its more expensive cousin, the MicroPro runs only a 1.8GHz desktop chip.

The D400S extends its expandability with the inclusion of two rear-mounted USB 2.0 ports and a front-mounted FireWire port and is one of the few slim notebooks that still offers an internal floppy drive. Also included is a Wi-Fi adaptor, along with an Ethernet port.

The puny chip left us in little doubt that performance would suffer. The D400S certainly failed to impress under benchmarking and struggled to achieve 18.9 in Business Winstone 2002.

It was also let down by the SIS 650 chipset and could only manage 28fps under our Quake III tests.

Considering the number of similarly-priced notebooks elsewhere in this roundup, which offer a faster CPU, more RAM and a larger hard drive, the MicroPro is one to avoid.

Details	
	Dn $
Contact	MicroPro
Phone	(03) 9568 6911
Online	www.micropro.com.au
Price	$2,695
✔	Low price.
✖	3D performance.
Verdict	●●○○○



NEC Versa E600

With similar specs to those of the M300 (below), this Versa runs on a 2GHz Pentium 4-M processor with 256MB of DDR SDRAM. This pairing produced a disappointingly low rating of 17.4 under Business Winstone 2002.

An ATI Radeon IGP chipset powers the graphics subsystem and 15in 1,024 x 768 pixel TFT screen. Again, the score here was slighly below par at 1,554 in 3DMark 2001.

The storage subsystem consists of a fixed CD-RW/DVD combo, 30GB hard disk and even a floppy drive. Connectivity abounds with serial, parallel, USB and PC Card slots, plus a 56K modem, Ethernet and 802.11b.

Most keys on the keyboard are the standard size, with the audio CD controls and a power switch above it.

We found the keyboard to be comfortable for long periods of typing, although 3.5 hours is as long as you'll get from the battery.

This is a typical case where the price is appealing but a closer look reveals performance that's off the pace. There's better value to be found for your $3,000.

Details	
	DR $
Contact	NEC Computers
Phone	1800 632 777
Online	www.nec-online.com.au
Price	$2,999
✔	Affordability.
✖	Below average performance.
Verdict	●●●○○



NEC Versa M300

While the M300 looks quite different to the E600 (above), the internals are strikingly similar. As is the lack of punch.

On the inside, a Pentium 4-M 2GHz CPU drives calculations, while an ATI Radeon IGP GPU outputs data to the screen.

On the *APC* Labs text bench the M300 failed to stand out from this very crowded notebook comparo.

Real-world and synthetic application and gaming tests were as lacklustre as the E600. The battery life tipped 3.5 hours but anyone seeking a notebook suited to CPU-intensive applications should look elsewhere.

The feature roster includes a floppy drive, CD-RW/DVD combo, 56K modem and Ethernet, plus three USB 2.0, two PC Card slots, serial and parallel ports are. In common with some two dozen machines in the roundup, the M300 has an S-Video output for connection to your TV set.

The keyboard is comfortable to use, and headphone and microphone jacks, the FireWire port and volume control wheel are all sensibly located on the front panel.

Details	
	DR
Contact	NEC Computers
Phone	1800 632 777
Online	www.nec-online.com.au
Price	$3,299
✔	Good value; unique appearance.
✖	Performance.
Verdict	●●◐○○



NEC Versa S900

The Centrino-spec Versa S900 performs soundly, with the looks to match.

The 1.3GHz Pentium M is supplemented by 256MB of DDR SDRAM, while an ATI Mobility Radeon 9000 GPU throws images at the 12.1in, 1,024 x 768 pixel screen.

The S900's 3DMark2001 score of 5,013 indicates adequate gaming performance for its class, while the fixed DVD/CD-RW drive comes in handy when transferring data to and from the 40GB hard disk.

The brushed aluminium top cover complements the midnight blue exterior and keyboard, although some keys (particularly the arrow keys) are very narrow and difficult to strike cleanly.

A pair of PC Card slots, three USB ports and a FireWire port head up the connectivity menu, and sit alongside the Ethernet and 56K modem ports on the side panels.

The Versa S900 achieved good mileage for a lightweight contender, and chalked up nearly three hours under battery tests in our labs.

Details	
	DR AR
Contact	NEC Computers
Phone	1800 632 777
Online	www.nec-online.com.au
Price	$3,999
✔	Appearance; 3D performance.
✖	Narrow keys.
Verdict	●●●◐○



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NEC Versa LitePad



Based on a Pentium III-M CPU, the Versa LitePad appears to be the harbinger of tablet size and weight to come.

Just under 1kg, it's the same size as an A4 sheet. The vivid 10.4in TFT panel switches between portrait and landscape mode.

A discreet Wi-Fi antenna folds into its side, with conventional LAN connectivity available through an Ethernet port.

Three USB ports and a CF card slot are also available, but internal storage is limited to 20GB.

Unlike the Acer tablet, the NEC has no keyboard, making extended text data entry a chore. Not that you'll have much time to scribble on the screen, however, with the LitePad barely managing two hours between charges.

It also dawdled through the peformance tests, finally filing 11.2 under Business Winstone. Of course, that might be all you need for entering data onto the screen.

This could be a much better machine if fitted with a Centrino-class Pentium M chip.

Details	
	UP
Contact	NEC Computers
Phone	1800 632 777
Online	www.nec-online.com.au
Price	$3,999
✔	Size, shape and weight.
✖	Text data entry.
Verdict	●●●◐○

Optima Centoris E



For performance alone, this is one of the best in this roundup. Optima is known as a producer of AMD-powered notebooks, but this Centrino-based unit bucks the trend.

At its heart is a 1.6GHz Pentium M processor mated to 256MB of RAM and a 30GB hard disk. The 15in screen runs at 1,024 x 768 pixels and is powered by a Radeon 9000 chipset. A DVD-ROM/CD-RW combo drive rounds out the package.

The Centoris E's plain exterior belies the power within. The MobileMark score of 147 was very good, and battery life was going on five hours.

The 802.11b Wi-Fi can be disabled physically via an (unmarked) blue toggle on the front panel. There's also an unlabelled SD Card slot close to the button.

Under benchmarking, the Centoris performed reasonably, although it would be helped by an extra 256MB of RAM.

Despite the meagre RAM, this is a great performer with awesome battery life. But expect better deals elsewhere.

Details	
	DR AR
Contact	Optima Computer Technology
Phone	(02) 9475 2777
Online	www.optima.com.au
Price	$3,499
✔	Battery life.
✖	Needs more RAM.
Verdict	●●●○○

Pioneer D270S



Made for Pioneer by Clevo, the D270S is based on a 2.4GHz Pentium 4 desktop processor. This choice is not particularly unusual in modern notebooks, but it does have implications.

Desktop Pentium 4 chips crammed into notebooks run extra hot, and the Pioneer unit emitted a roar from the cooling mechanism.

On first boot, or whenever the notebook shakes itself out of an idle state, the fan powers up like a jet engine. A large vent is on the right side of the unit, and anything in its way becomes too hot to touch.

While the Pioneer unit suffers from heating issues, it doesn't score any points in other areas either. It isn't thin, light or particularly quick. At 1,279 3DMarks, the SiS chipset-integrated graphics are off the pace, and eat up 32MB of available 256MB of RAM.

And the 90 minute battery life was the second worst we saw: it's not even enough to watch a movie on the built-in DVD drive (which also doubles as a CD-RW burner).

Details	
	On $
Contact	Pioneer Computers
Phone	(02) 9690 2888
Online	www.pioneer computers.com.au
Price	$2,399
✔	Low price.
✖	Heat; battery life.
Verdict	●●◐○○

Pioneer D400E



Although the D400E closely resembles the MicroPro D400S, there are differences inside. Pioneer has fitted a 3.06GHz Pentium 4 CPU to the D400E, to partner the 256MB of RAM, and the performance difference is conspicuous.

Both models use different SiS chipsets, but the D400E opts for the Mobility Radeon 9000 graphics adaptor, which boosts video performance considerably.

The desktop CPU powers through the benchmarks at an impressive clip, with 6,646 under 3DMark2001 and 23.5 under Business Winstone 2002.

As with the D270S (above), the fan is very audible, although as it ran at a constant speed there wasn't the annoying change in pitch which affects other P4 desknotes.

Wi-Fi is available through a mini-PCI adaptor, and a Bluetooth module can also be fitted. Unfortunately, as with all notebooks equipped with both Wi-Fi and Bluetooth, these wireless technologies can't be used at the same time because of interference issues.

The battery run-down time of 90 minutes is certain to leave many unsuspecting users high and dry.

Details	
	On
Contact	Pioneer Computers
Phone	(02) 9690 2888
Online	www.pioneer computers.com.au
Price	$3,499
✔	Solid all-round capabilities.
✖	Limited battery life.
Verdict	●●●◐○



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Pioneer D5800DS



The D5800DS is yet another Pioneer-branded desktop replacement manufactured by Clevo. It's bulky (over 4cm high and weighs close to 4kg).

It's also home to a 3.06GHz Pentium 4 desktop CPU, which makes it one of the strongest performers in the pack.

The screen runs at a native resolution of 1,600 x 1,200 and is well-suited to high-end graphics work. Our testing confirmed the raw power of the D5800DS unit, especially in video performance.

A Mobility Radeon 9000 graphics chipset rated a stratospheric 7,027 3DMarks. Application benchmarks were soft, such as the low 103 under MobileMark.

The current-chugging desktop processor saw running time drop to the same 90 minutes as the other Pioneers tested.

To alleviate this, the D5800DS comes with an extra battery that fits into the optical drive bay. But of course you still can't watch a DVD with this fitted because it replaces the combo DVD/CD-RW drive.

Details	
	DN
Contact	Pioneer Computers
Phone	(02) 9690 2888
Online	www.pioneercomputers.com.au
Price	$4,399
✔	Video performance.
✖	Short battery life.
Verdict	●●◐○○

Protac Excel Eco732



Protac is becoming well-known for desknotes. This one uses a 2.66GHz Pentium 4 with a 533MHz frontside bus and SiS 645DX chipset. The arrangement seems a good one, balancing performance and battery life.

A 40GB hard disk is included, along with 1GB of RAM, which certainly helped bolster the test scores (and once again proves that memory can be the most cost-effective upgrade for *any* PC, desktop or notebook).

The performance was predictably impressive with a score of 25.6 under Business Winstone 2002. The LCD runs at a native resolution of 1,280 x 1,024 pixels, driven by a Mobility Radeon 8500 graphics adaptor.

Battery life of 2.5 hours under BatteryMark was above average for desknotes.

A combo DVD-ROM and CD-RW drive and a bank of four USB ports complete the feature set. Placing all the USB ports so close to each other does prove frustrating when plugging in multiple devices.

Details	
	DN
Contact	Protac Australia
Phone	(02) 8748 8888
Online	www.protac.com.au
Price	$3,399
✔	Compromise between performance and battery life.
✖	Cramped USB ports.
Verdict	●●●○○

Targa Traveller S1



The Traveller S1 is a smart-looking notebook with some resemblance to the Toshiba Tecra 9000. It's priced at the basement end although it features a 2.66GHz Pentium 4 desktop CPU.

As usual, fitting a desktop processor causes the unit to become unbearably hot around the underside of the chassis where the CPU is located.

It's also especially difficult to benchmark. Testing in BatteryMark or MobileMark failed because the unit cut the benchmarks short as battery levels drop. This can't be overrriden by software and BIOS settings, so we had to default to manual testing, and estimate a running time of just under two hours with an average workload.

Size, weight and performance are ordinary, but the sleek silver chassis of the Traveller will turn heads.

Those looking for an attractive budget notebook with reasonable power should find this a viable option. Just be wary of being caught short by the battery.

Details	
	DN $
Contact	AKA Technology
Phone	(03) 9562 0022
Online	www.akatech.com.au
Price	$2,269
✔	Design.
✖	Runs very hot; short battery life.
Verdict	●●◐○○

Targa Visionary XP



The Visionary XP is one of the few notebooks with a Mobile Athlon CPU. It has an XP-M 2400+ processor along with 256MB of RAM, but a paltry 20GB hard disk.

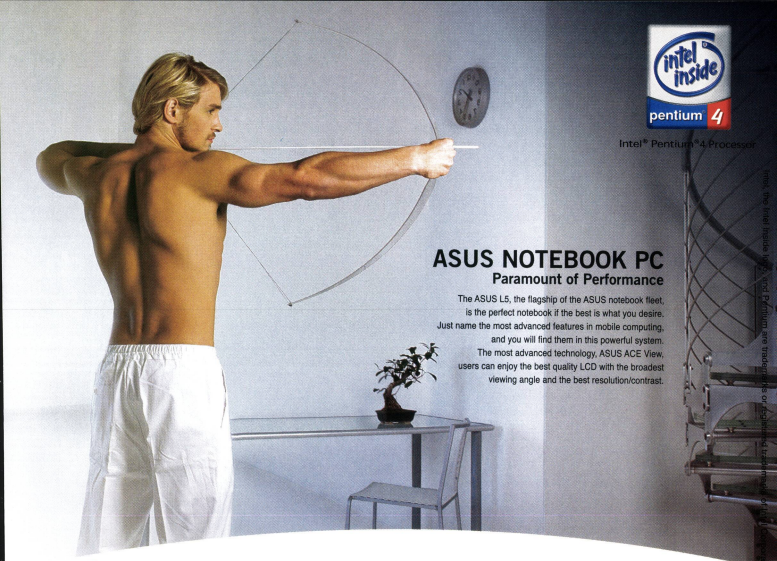
The XP-M 2400+ nominally rates as the equivalent of a 2.4GHz Pentium 4, but comparisons can be tricky as AMD's naming game in the desktop space has proven.

Under *APC* tests, the Visionary manages 24.4 under Business Winstone and 140 under MobileMark. These numbers weren't let down by the Mobility Radeon 9000 chipset, which boosted graphics performance to some impressive scores, including 6,430 under 3DMark2001. But the resolution is limited to a maximum 1,024 x 768.

Battery life was rated at about 2.5 hours, which is about mid-range for this type of machine.

AMD-powered notebooks tend to find less favour than Intel machines when it comes to the buying habits of large corporate and government accounts. The Targa Visionary XP proves that they should be worth a closer look.

Details	
	DN $ AR
Contact	AKA Technology
Phone	(03) 9562 0022
Online	www.akatech.com.au
Price	$2,299
✔	Graphics performance
✖	Limited maximum resolution
Verdict	●●●◐○



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Tiex Computers	03 9877 7011
Top 5 Computers	03 9888 1355

Western Australia

Austin Computers	08 9201 2788
Computer Cybershop	08 9227 8589
PLE Computers	08 9309 4771

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Toshiba Portege R100

Many *APC* readers will be familiar with Toshiba's slim-line Portégé 2010, which has previously won an Editor's Choice award.

The Centrino-class R100 takes the same ultra-slim chassis and light 1.5kg weight (including the secondary battery) and swaps the 2010's PIII-M processor for a 900MHz Pentium M chip.

Battery life hit 8.5 hours at its most aggressive power-management settings with the secondary battery clamped onto the R100's underbelly.

As expected, it isn't a great performer under gaming or entertainment tests, not even managing to complete any of our suite of graphics tests.

But that's not what the R100 is about. Its main selling point is that it'll run for as long as you need, at the greatest degree of comfort.

The most serious shortcoming is that it has no optical or floppy drive (although you do get an SD card slot), which means software must be loaded off the network or via a cost-extra CD drive.

Details	
	UP
Contact	Toshiba Australia
Phone	13 30 70
Online	www.toshiba.com.au
Price	$4,400
✔	Featherweight; amazing battery life.
✖	Poor graphics, no optical drive.
Verdict	●●●●○



Toshiba Satellite 1130

Placed at the low end of the Toshiba range, the Satellite 1130 is fitted with a Mobile Celeron 1.8GHz CPU and tips the scales at 2.8kg. Memory is rated at 239MB, as 256MB is fitted but shared with the integrated Intel Extreme Graphics 852/855 chipset.

All benchmark results show mid-range scores. This notebook plods a little but completes everything thrown at it.

The fact is, most people don't need a high-powered notebook to get what they want out of a mobile computer. The 1130 shows that basic office tasks, audio and DVD playback, and light gaming can be achieved on a modest budget.

While the lack of wireless connectivity may irk some, a Wi-Fi aerial is built into the chassis and an 802.11b mini-PCI card is available from Toshiba as a tick-a-box option.

With a modem, Ethernet, FireWire and DVD playback, there's plenty for those wanting to compute on the move. The battery is also up to the task, topping three hours.

Details	
	DR $
Contact	Toshiba Australia
Phone	13 30 70
Online	www.toshiba.com.au
Price	$2,200
✔	Low price.
✖	Wi-Fi not included.
Verdict	●●●●○



Toshiba Satellite 2410

The Satellite 2410 sits in the middle of the Toshiba range. It's a full-featured notebook based on a 2GHz Pentium 4-M CPU. Our review model sported a 15in TFT, although you can shave the price tag by opting for the lower spec version with a 14.1in screen.

Among the stand-out inclusions are a DVD-ROM/CD-RW combo drive and two PC Card slots instead of the now standard single slot.

The Satellite 2410 omits a serial port, but you get the old and the new for compact media: a 3.5in floppy drive, as well as the SD card slot (which is now common to most Toshiba notebooks).

Some ports, like the S-Video, VGA and parallel sockets, hide behind a hatch thus maintaining a sleek look.

Unfortunately it failed to run 3DMark2001 Pro because it musters only 16MB of frame buffer memory.

A year ago the 2410 would have been impressive, but considering the price and the spec, it's now at the end of the road

Details	
	DR
Contact	Toshiba Australia
Phone	13 30 70
Online	www.toshiba.com.au
Price	$3,190
✔	Choice of 14.1 or 15in displays.
✖	Low video memory
Verdict	●●◐○○



Toshiba Tecra S1

While the Pentium M chip was originally aimed at thin-and-light notebooks, its successful appearance in this desktop replacement machine proves the versatility of Intel's made-for-mobile chip.

A 1.6GHz Pentium M processor, 512MB of RAM and bountiful 60GB hard disk form the core. A wide range of configuration options are available: our review model included a DVD/CD-RW combo drive. Like other Toshiba notebooks the S1 has an SD slot.

The 15in display runs at a massive resolution of 1600 x 1200 pixels, rendering the standard screen fonts almost unreadable.

However, it shone using graphics and video-editing applications, largely due to the dedicated Radeon 9000 chipset.

The S1 was not as quick as other desktop replacement units — 26.4 under Business Winstone 2002 — but battery life was an outstanding four hours. We also enjoyed seeing both touchpad and trackpoint controls rather than Toshiba's usual solitary stick.

Details	
	DR AR
Contact	Toshiba
Phone	13 30 70
Online	www.toshiba.com.au
Price	$5,720
✔	Battery life.
✖	Bulky.
Verdict	●●●◐○



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Slim in Size ; Rich in Features

The ASUS M2N incorporates latest mobile computing technology-Intel® Centrino™ Mobile Technology. Its modular design allows flexibility for swapping internal CD, DVD, Combo, CD-RW floppy or a 2nd hard drive. Use high-speed external peripherals such as hard drives, scanners, or digital camcorders at SCSI speeds with built-in IEEE 1394 and USB2.0 support. Of course standard features such as integrated LAN, modem and PCMCIA support are also available.



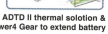
Intel® Centrino™ Mobile Technology



PortBar III and swappable multi-module



Optional 4- in-1 Card Reader (SM/SD/MS/MMC)



ADTD II thermal solution & Power4 Gear to extend battery life



M2N

M24N150CM

14.1" TFT XGA

Intel® Pentium® M Processor 1.5 GHz

Intel® PRO/Wireless 2100 Network Connection 802.11b

Intel® 855 Chipset Family

CD-RW/DVD COMBO Drive Built in

256MB Memory

40G HDD

XP Professional

$3,099 AUD Inc. GST

Wireless connectivity and some features may require you to purchase additional services or external hardware. Availability of public wireless LAN access points limited. System performance measured by MobileMark® 2002. System performance, battery life, wireless performance and functionality will vary depending on your specific hardware and software configurations. See *http://www.intel.com/products/centrino/mm/more_mfo for more information*

Qld Customers.

Computer Alliance 07 3421 3200
Instant IT 07 3292 0216
Alek Systems 07 3257 1772
Cyclone Computer 07 3891 2520
Hunts Computers 07 4659 6800
KTC - Brisbane (Head Office) 07 3356 8488
ACT
Fairstar 02 6257 1808

NSW

ARC Computers 02 9884 8655
AVO Computacare 02 9959 3328
Beyond Computer 1300 130 029
Computer Warehouse 02 9519 2888
Digital Star 02 9529 2866
Ecom Computers 1300 369 838
KS Computer Technology 02 9568 5588
Notebook World 02 9267 2233
Princeton Computers 02 9313 8811
TEG Computers 02 9223 2360
THX Computers 02 9262 1588

Vic

Centrecom 03 9530 0988
Computerworld 03 9419 9922
Computer Source 03 9348 0338
Greenlight Systems 03 9543 3312
i store 03 9894 8498
Landmark Computers 03 9898 4424
Techware 03 9558 0788
Teca Computers 03 9877 7071
Top 5 Computers 03 9889 1355

Western Australia

Austin Computers 08 9201 2788
Computer Cybershop 08 9227 8589
PLE Computers 08 9309 4771

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Twinhead efio1 2413

The oddly-named efio1 2413 closely resembles the recently reviewed Twinhead 2312 (*APC* March, page 44). The 2413 Twinhead's ultraportable model and while a light 1.7kg in weight, it's also light on power.

It failed to finish most tests and was second-rate in those it did complete, such as a disappointing 18.5 under Business Winstone. Battery tests also failed, but we estimate around two hours between charges.

The diminutive dimensions and styling are the same as the 2312's and it features the same internals (that includes the SiS 630-based chipset and 8x DVD-ROM drive).

However, the processor has been stepped up to a 1.3GHz Mobile Celeron and a Gemtek mini-PCI Wi-Fi card is now included.

Unfortunately, it also comes with similar complaints. The keyboard is cramped and the mini-spacebar makes typing difficult.

The most pressing need is for a faster CPU. Upgrading from a 1.2GHz to 1.3 GHz Celeron has made little difference overall, and playing DVDs overloads the CPU and causes stuttering.

Details	
	UP
Contact	Twinhead
Phone	(03) 9375 3545
Online	www.twinhead.com.au
Price	$2,399
✔	Light weight.
✖	Poor performance.
Verdict	●●○○○



Twinhead efio1 2B18

Ruggedised notebooks tend to be underpowered because stability and robustness are often put ahead of raw performance. A 1.8GHz Pentium 4-M CPU, 384MB of RAM, and a 40GB hard disk power this 2B18, so it's no weakling.

A Winstone 2002 score of 20.5 places it above most notebooks in this price bracket, and battery life was just under 2.5 hours.

But the puny S3 ProSavage 8MB graphics chipset meant the 2B18 failed our 3D tests.

While the water-resistant keyboard won't see the 2B18 survive an accidental dunking in the pool, it's more than enough to protect against a wayward can of drink. The hard disk housing is also designed to withstand more bumps than the average notebook.

Another ingenious addition is a lock on the DVD drive that prevents accidental opening; and with three USB 2.0 ports there's excellent room for plugging in peripherals.

This is a solid machine that's very suitable for users frequently working outdoors.

Details	
	DR
Contact	Twinhead Australia
Phone	(03) 9375 3545
Online	www.twinhead.com.au
Price	$2,299
✔	Spill-proof; cheap.
✖	Abysmal 3D performance.
Verdict	●●●●○

Eight great notebook accessories

Case study: Don't skimp on a good notebook bag. Only half of the machines in this roundup came with a carry case, although many buyers prefer to spend-up on their own choice of a bag. Even a $300 bag can be considered cheap insurance against the cost of damaging your notebook, and there's also the convenience factor that comes with having a bag that fits your needs. These range from the traditional business-style over the shoulder bag (ideally with ample pockets for storing accessories, documents and so on) to backpacks, and even rolling cases for the constant traveller. Some brands to check out include Belkin, Crumpler, Kensington, Targus and STM.

Well connected: Almost all plug-and-play peripherals do so via USB, but few notebooks have more than two USB ports, and even those with four ports can quickly become over-crowded. A pocket-sized USB hub makes life much easier, especially if you use a USB extension cable to put the ports closer to you rather than having to fiddle around at the rear of the notebook.

Fast lane: External hard drives and CD burners need more speed than the USB 1.1 spec can provide, but we're still far from seeing FireWire and USB 2.0 as standard kit on notebooks. The best bet is a dual-purpose adaptor card, such as Adaptec's DuoConnect, which plants a pair of USB 2.0 ports and a single FireWire ports onto a PC Card.

Mobile mice: Some notebook users learn to live with trackpads and pointer sticks, but most will happily go back to a mouse if they have the choice. There's no shortage of mini-mice on the market; most use optical sensors and you can even find some nifty wireless ones.

Backup on the run: The more you rely on your notebook, the more you need to back it up. If you're still after an excuse to buy an external hard drive, that's probably the clincher, although you'll need to be sure your notebook has the necessary USB 2.0 or FireWire ports required by such drives (forget about USB 1.1, it's painfully slow for moving large amounts of data). And you'll need to get a drive compact enough to carry with you.

Another option is a PC Card hard drive. They're more expensive, have a lower capacity and are less versatile than an external portable drive, but they're small, hassle-free and you don't need to worry about cables or AC adaptors.

End the card shuffle: If a digital camera or handheld is your notebook's travelling companion, think about a USB or PC Card adaptor which lets your notebook read and write to the relevant memory card format. Better yet, get a multi-format USB reader.

Lock it down: Don't let your notebook go walkabout. A security cable fitted with a Kensington lock will keep it in place. This is especially practical for desktop-replacement notebooks which might spend more time sitting on your desk — after hours and on weekends — than being carted around with you.

Globetrotter: Overseas travellers need to arm themselves with power adaptors (and in some cases telephone plugs) to suit their destination. You can find an assortment of adaptors at most travel supply stores, or pick from a collection of ready-to-go regional packs from Targus.



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So Light yet So Powerful

The ASUS S1N incorporates latest mobile computing technology- Intel® Centrino™ Mobile Technology. Based on Intel's advanced Centrino™ Mobile Technology, the ASUS S1N packs powerful performance in a nimble yet stylish casing to let you work efficiently and look good at the same time.



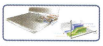
Intel® Centrino™ Mobile Technology



PortBar III and swappable multi-module



Optional 4- in-1 Card Reader (SM/SD/MS/MMC)



ADTD II thermal solotion & Power4 Gear to extend battery life



S1N

S13N150CM

13.3" TFT XGA

Intel® Pentium® M Processor 1.5 GHz

Intel® PRO/Wireless 2100 Network Connection 802.11b

Intel® 855 Chipset Family

CD-RW/DVD COMBO Drive Built in

256MB Memory

40G HDD

XP Professional

$3,039 AUD Inc. GST

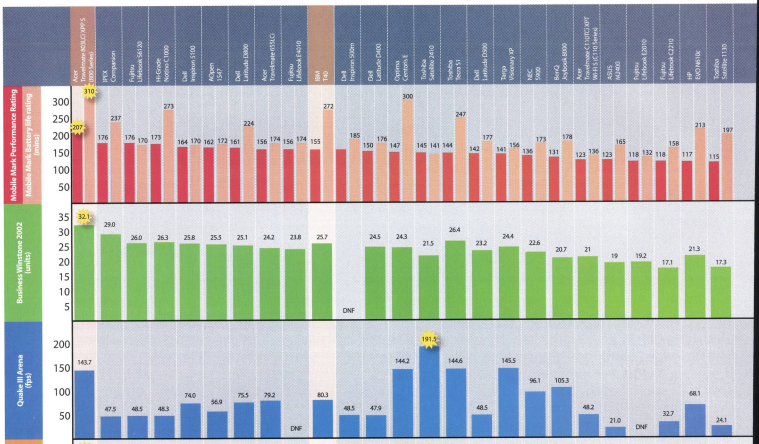
Wireless connectivity and some features may require you to purchase additional services or external hardware. Availability of public wireless LAN access points limited. System performance measured by MobileMark* 2002. System performance, battery life, wireless performance and functionality will vary depending on your specific hardware and software configurations. *See http://www.intel.com/products/centrino/more_info for more information*

Qld Customers.

Computer Alliance	07 3421 3200	ARC Computers	02 9884 8655	Princeton Computers	02 9313 8811	Greenlight Systems	03 9543 3312	**Western Australia**			
Instant IT	07 3292 0216	AVO Computacare	02 9959 3328	TEG Computers	02 9223 2360	I store	03 9894 8466	Austin Computers	08 9201 2788		
Able Systems	07 3257 1772	Beyond Computer	1300 130 029	THX Computers	02 9262 1566	Landmark Computers	03 9899 4424	Computer Cybershop	08 9227 8989		
Cyclone Computer	07 3891 2520	Computer Warehouse	02 9519 2888			Techwave	03 9558 0766	PLE Computers	08 9309 4771		
Hunts Computers	07 4659 6800	Digital Star	02 9929 2868	**Vic**		Teca Computers	03 9877 7071				
FTC - Brisbane (Head Office)	07 3358 8488	Ecom Computers	1300 369 838	Centrecom	03 9530 0988	Top 5 Computers	03 9899 1355				
ACT		KS Computer Technology	02 9568 5688	Computerworld	03 9419 9922						
Fairstar	02 6257 1808	Notebook World	02 9267 2233	Computer Source	03 9348 0338						

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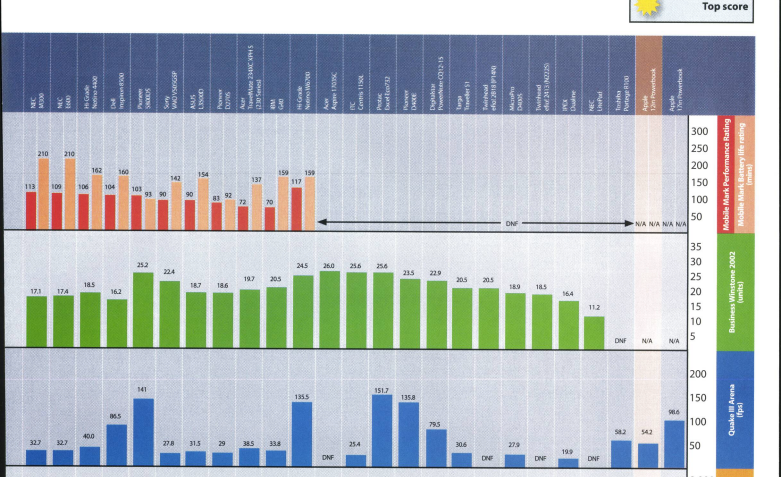
Benchmarks



Sandra 2002 SP-1																													
CPU ALU (MIPS)	5,238	5,269	5,273	5,371	5,383	4,299	5,256	4,456	4,624	5,054	4,584	4,597	5,226	3,869	5,442	4,260	4,917	4,373	3,430	2,925	3,808	4,461	3,281	3,814	3,486				
CPU FPU (kFLOPS)	2,054	2,061	2,063	2,052	1,521	1,201	2,057	1,281	1,809	1,932	1,794	1,790	2,046	1,069	2,022	1,667	2,426	1,671	958	1,146	1,069	1,286	959	2,471	964				
Integer Multimedia (it/s)	6,988	7,012	7,017	6,980	11,016	8,744	6,996	9,299	6,151	6,573	6,100	6,026	6,956	7,896	6991	5,670	9,870	5,682	6,935	3,893	7,862	9,382	6,991	7,801	7,070				
FPU Multimedia (it/s)	10,234	10,270	10,278	10,222	13,621	10,922	10,245	11,612	9,012	9,628	8,934	8,799	10,187	9,822	10,133	8,303	11,406	8,322	8,665	5,702	9,831	11,665	8,701	9,663	8,745				
Drive Index (C:)	20,244	15,081	14,246	18,201	15,403	15,002	13,423	16,139	15,555	16,480	14,060	14,574	16,173	15,711	16,222	16,752	13,616	15,654	16,034	13,129	13,314	15,944	13,056	15,121	10,261				
RAM Int Buffered (MB/s)	855	756	796	993	926	944	778	976	918	916	917	1,461	900	1,905	902	785	807	913	756	897	1,655	667	755	1,034	1,063				
RAM FPU Buffered (MB/s)	859	773	825	1,027	928	944	795	976	957	948	942	1,476	928	1,914	944	809	777	950	761	904	1,674	690	765	1,067	1,076				
BatteryMark (mins)	294	230	167	263	169	176	204	168	192	283	195	177	284	167	267	171	150	162	195	136	155	125	176	215	198				
Winstone MCC 2003	39.5	37.1	DNF	DNF	DNF	32.3	DNF	35.8	30.2	DNF	29.6	32.6	32.5	29.0	DNF	30.3	25.5	DNF	DNF	24.1	25.3	DNF	21.9	DNF	23.7				
Winbench																													
Business Disk WinMark	7,000	5,160	5,130	4,270	3,770	5,100	3,820	5,000	5,410	3,870	4,200	3,620	3,510	3,520	4,221	3,300	5,180	3,830	5,560	5,080	3,410	5,380	5,240	2,950	3,100				
Business Graphics WinMark	767	261	473	489	355	680	252	640	414	636	322	322	805	590	802	204	704	755	482	162	384	331	230	590	319				

it/s: iterations per second

Editor's Choice
DNF Did Not Finish
Top score



																											Sandra 2002 SP-1
3,750	3,770	4,233	1,806	5,956	4,164	4,596	4,677	4,227	5,789	4,672	4,989	5,190	4,986	5,932	4,178	5,067	3,502	3,421	3,700	4,629	2,599	2,937	N/A	N/A	CPU ALU (MIPS)
1,067	1,069	1,182	737	1,666	1,173	2,312	1,283	1,176	1,597	1,341	1,433	1,438	1,427	1,670	2,107	1,430	963	926	1,784	1,286	1,229	1,149	N/A	N/A	CPU FPU (MFLOPS)
7,773	7,768	8,729	3,793	12,097	8,477	9,195	9,411	8,609	11,853	9,777	10,460	10,509	10,434	12,114	11,153	10,502	7,037	6,999	7,262	9,395	5,021	3,911	N/A	N/A	Integer Multimedia (it/s)
9,686	9,684	10,875	4,479	14,948	10,557	10,628	11,635	10,667	14,696	12,104	12,953	13,015	12,913	14,976	19,402	12,991	8,695	8,553	9,015	11,617	6,235	5,728	N/A	N/A	FPU Multimedia (it/s)
12,711	12,432	11,095	14,195	16,844	16,554	12,529	14,240	12,758	15,644	15,807	21,282	15,703	14,636	13,828	15,868	15,676	7,724	15,015	9,446	10,755	9,784	12,984	N/A	N/A	Drive Index (C:)
700	717	1,524	866	921	958	688	717	1,036	1,424	755	869	1,024	1,084	1,033	850	981	601	902	309	944	244	782	N/A	N/A	RAM Int Buffered (MB/s)
740	756	1,526	467	916	962	674	696	1,041	1,420	764	908	1,016	1,086	1,073	864	982	616	935	307	933	246	750	N/A	N/A	RAM FPU Buffered (MB/s)
207	208	175	161	91	144	137	95	139	152	162	DNF	182	146	91	96	DNF	144	136	126	143	126	513	N/A	N/A	BatteryMark (mins)
24.3	24.1	26.3	17.4	38	DNF	21.7	26.5	27.9	31.1	DNF	36.2	DNF	39.9	34.3	36.8	DNF	DNF	25.1	DNF	27.3	DNF	DNF	N/A	N/A	Winstone-NCC 2003
																									Winbench
3,470	2,840	3,250	3,700	4,310	3720	3,630	3,330	4,520	2,070	3,170	7,130	5,080	3,720	3,730	3,470	3,360	4,230	5,310	4,990	4,930	1,920	3,790	N/A	DNF	Business Disk WinMark
417	417	418	270	760	226	372	416	247	217	669	452	457	710	734	499	514	189	382	139	208	69	218	N/A	DNF	Business Graphics WinMark

Labs Challenge

	IPEX Duoline	Toshiba Satellite 1130	Targa Traveller S1	Targa Visionary XP	Twinhead efio! 2B18 (P14N)	ASUS L3500D	Acer TravelMate 234XC XPH S (230 Series)	Pioneer D2705	Twinhead efio! 2413 (N2225)	Hi-Grade Notino 4400	MicroPro D4005	Dell Inspiron 500m
Price	$2,150	$2,200	$2,269	$2,299	$2,299	$2,365	$2,399	$2,399	$2,399	$2,495	$2,695	$2,699
CPU	Celeron 2.40GHz	Mobile Celeron 1.80GHz	P4 2.66GHz	Athlon XP-M 2400+	P4-M 1.80GHz	Athlon XP-M 2000+	Mobile Celeron 2.20GHz	P4 2.40GHz	Mobile Celeron 1.33GHz	P4-M 2.20GHz	P4 1.80GHz	Pentium M 1.40GHz
Chipset	SiS650	i855GM	SiS650	VIA Apollo KT266	VIA P4M266	SiS740	i845GL	SiS650	SiS630	SiS650	SiS650	i855GM
RAM	512MB	256MB	256MB	256MB	384MB	256MB	256MB	256MB	384MB	256MB	256MB	256MB
Graphics	SiS650 (Shared)	i82855GM (Shared)	SiS650 (Shared)	Mobility Radeon 9000 (64MB)	S3 ProSavage DDR (Shared)	SiSM740 (Shared)	i82845G (Shared)	SiS650 (Shared)	SiS630 (Shared)	SiS650 (Shared)	SiSM650 (Shared)	i82855GM (Shared)
Screen Size and Native Resolution	15in 1,024 x 768	14.1in 1,024 x 768	14.1in 1,024 x 768	15.1in 1,024 x 768	14.1in 1,024 x 76 8	15in 1,024 x 768	14.1in 1,024 x 768	14.1in 1,024 x 768	12.1in 1,024 x 768	14.1in 1,024 x 76 8	14.1in 1,024 x 768	14.1in 1,024 x 768
HDD	40GB	30GB	20GB	20GB	40GB	40GB	20GB	30GB	40GB	20GB	20GB	30GB
CD/DVD	24/24/10x CD-RW/8x DVD-ROM	8x DVD-ROM	24/24/10x CD-RW/8x DVD-ROM	24/24/10x CD-RW/8x DVD-ROM	24/24/10x CD-RW/8x DVD-ROM	24/24/10x CD-RW/8x DVD-ROM	24/10/8x CD-RW/8x DVD-ROM	24/24/10x CD-RW/8x DVD-ROM	24/24/10x CD-RW/8x DVD-ROM	24/24/10x CD-RW/8x DVD-ROM	24x CD-ROM	8x DVD-ROM
Floppy	None	None	None	None	None	Yes	Yes	Yes	None	Yes	Yes	None
OS	WinXP Home	WinXP Pro	WinXP Pro	WinXP Home	WinXP Home	WinXP Home	WinXP Home	WinXP Home	WinXP Home	WinXP Home	WinXP Home	WinXP Home
Modem	Lucent AMR (V.90)	Toshiba AMR (V.90)	Smart Link 56K (V.90)	Smart Link 56K (V.90)	Smart Link 56K (V.90)	Ali HSP56 MR (V.90)	Agere Systems AC'97 (V.90)	Smart Link 56K (V.90)	Smart Link 56K (V.90)	Lucent AMR (V.90)	Smart Link 56K (V.90)	PCTEL 2304WT MDC (V.92)
Ethernet	Broadcom 440x 10/100baseT	Realtek RTL8139 10/100baseT	SiS 900-Based 10/100baseT	Realtek RTL8139 10/100baseT	VIA 10/100baseT	SiS 900-Based 10/100baseT	Realtek RTL8139 10/100baseT	Realtek RTL8139 10/100baseT	SiS 900-Based 10/100baseT	Realtek RTL8139 10/100baseT	Realtek RTL8139 10/100baseT	Intel PRO/100 VE 10/100baseT
Wireless	None	None	None	None	None	None	None	None	GemTek Wireless (802.11b)	None (optional)	NeWeb USB300 (802.11b)	Dell TrueMobile 1300 (802.11b/g)
Bluetooth	None	None	None	None	None	None	None	None	None	None	Yes	None
Infra-red	None	None	None	Yes	Yes	Yes	None	Yes	None	Yes	Yes	Yes
USB ports	4	3	3	2	3	2	2	2	3	2	3	2
FireWire	2 (2 x 4)	1 (1 x 4)	1 (1 x 4)	1 (1 x 4)	None	2 (2 x 4)	None	1 (1 x 4)	1 (1 x 4)	1 (1 x 4)	1 (1 x 4)	None
Pointing device	Touchpad	Touchpad	Touchpad with scroll buttons	Touchpad	Touchpad with scroll buttons	Touchpad with scroll buttons	Touchpad with scroll buttons	Touchpad	Touchpad with scroll buttons	Touchpad with scroll buttons	Touchpad	Touchpad
TV-out	None	Yes	Yes	Yes	Yes	Yes	Yes	Yes	None	Yes	Yes	Yes
Serial	None	None	None	None	None	1	None	None	None	1	1	1
Parallel	1	None	None	1	None	1	None	1	None	1	1	1
VGA-out	1	1	1	1	1	1	1	1	1	1	1	1
PCMCIA slots	1	1	1	1	1	2	1	None	1	1	1	1
Card reader	SD, Smart-Media, MMC, Memory Stick	None	None	None	None	None	None	None	None	None	None	None
Controller	Avance AC'97	Avance AC'97	SiS 7012	Realtek AC'97	VIA AC'97	SiS 7012	Crystal WDM AC'97	Realtek AC'97	SiS 7018	Avance AC'97	Realtek AC'97	SigmaTel C-Major
Battery capacity (hours)	2.5 (External)	3	2.5	2.5	2.5	2	2.5	2.5	2	2.5	Not stated	3.5
Warranty	2 year onsite	1 year return to base	1 year onsite	1 year onsite	1 year return to base	1 year return to base	1 year return to base	1 year onsite	1 year return to base	2 year return to base	Not stated	1 year onsite
Weight	3.3kg	2.8kg	2.7kg	3.1kg	2.43kg	3.3kg	3.0kg	3.25kg	1.7kg	3.2Kg	3.3kg	2.58kg

	ITC Centris 1150L	IPEX Companion	ASUS M2400	Acer Aspire 1703SC	NEC Versa E600	Apple 12in Powerbook	Digitalstar PowerNote CQ12-15	Toshiba Satellite 2410	Dell Inspiron 5100	AOpen 1547	NEC Versa M300	Protac Excel Eco732
Price	$2,699	$2,700	$2,805	$2,999	$2,999	$3,099	$3,099	$3,190	$3,199	$3,299	$3,299	$3,399
CPU	P4 2.66GHz	Pentium M 1.60GHz	P4-M 2.00GHz	P4 2.66GHz	P4-M 2.00GHz	PowerPC G4 867MHz	P4 3.06GHz	P4-M 2.00GHz	P4 2.80GHz	P4-M 2.40GHz	P4-M 2.00GHz	P4 2.66GHz
Chipset	SiS650	i855GM	SiS650	SiS650	ATI RS200M	Intrepid	i845GL	i845MP/MZ	i845GL	i855GM	ATI RS200M	SiS645DX
RAM	512MB	512MB	256MB	256MB	256MB	256MB	512MB	256MB	512MB	512MB	256MB	1,024MB
Graphics	SiS650 (Shared)	i82855GM (Shared)	SiSM650 (Shared)	SiSM650 (Shared)	Radeon IGP 340M (Shared)	GeForce4 440 Go (32MB)	Mobility Radeon 7500 (32MB)	GeForce4 420 Go (16MB)	Mobility Radeon 7500 (32MB)	i82855GM (Shared)	Radeon IGP 340M (Shared)	Mobility Radeon 8500 (64MB)
Screen Size and Native Resolution	14.1in 1,024 x 768	14.1in 1,024 x 768	14.1in 1,024 x 768	17in 1,280 x 1,024	15in 1,024 x 768	12.1in 1,024 x 768	15in 1,400 x 1,050	15in 1,024 x 768	15in 1,400 x 1,050	15in 1,024 x 768	15in 1,024 x 768	15in 1,400 x 1,050
HDD	40GB	40GB	40GB	80GB	30GB	40GB	40GB	40GB	40GB	60GB	40GB	40GB
CD/DVD	24/24/10x CD-RW/8x DVD-ROM	24/24/10x CD-RW/8x DVD-ROM	24/24/10x CD-RW/8x DVD-ROM	24/24/10x CD-RW/8x DVD-ROM	24/24/10x CD-RW/8x DVD-ROM	24/8/8x CD-RW/8x DVD-ROM	8x DVD-ROM	24/16/10x CD-RW/8x DVD-ROM	24/24/10x CD-RW/8x DVD-ROM	24/24/16x CD-RW/8x DVD-ROM	24/24/10x CD-RW/8x DVD-ROM	24/24/10x CD-RW/8x DVD-ROM
Floppy	None	None	None	Yes	Yes	None	None	Yes	None	None	Yes	None
OS	WinXP Home	WinXP Home	WinXP Pro	WinXP Home	WinXP Home	Mac OS X v10.2	WinXP Pro	WinXP Pro	WinXP Pro	WinXP Pro	WinXP Pro	WinXP Home
Modem	Smart Link 56K (V.90)	Actiontec MDC AC'97 (V.90)	Lucent AMR (V.90)	Agere Systems AC'97 (V.90)	Agere Systems AC'97 (V.90)	(V.92)	Conexant SoftK56 (V.90)	Toshiba AMR (V.90)	Conexant D480 MDC (V.92)	Agere Systems AC'97 (V.90)	Agere Systems AC'97 (V.90)	Ali HSP56 MR (V.90)
Ethernet	SiS 900-Based 10/100baseT	Intel PRO/100 VE 10/100baseT	SiS 900-Based 10/100baseT	SiS 900-Based 10/100baseT	Realtek RTL8139 10/100baseT	(10/100base-T)	Realtek RTL8139 10/100baseT	Intel PRO/100 VE 10/100baseT	Broadcom 440x 10/100baseT	Realtek RTL8139 10/100baseT	Realtek RTL8139 10/100baseT	SiS 900-Based 10/100baseT
Wireless	None	Intel PRO/Wireless 2100 (802.11b)	Intel PRO/Wireless 2100 (802.11b)	None	Agere Systems (802.11b)	None	None	None	Dell TrueMobile 1300 (802.11b/g)	None	Agere Systems (802.11b)	None
Bluetooth	None	None	None	None	None	Yes	None	None	None	None	None	None
Infra-red	None	Yes	Yes	None	None	None	Yes	Yes	None	Yes	None	Yes
USB ports	2	4	2	4	3	2	3	3	2	3	3	4
FireWire	1 (1 x 4)	1 (1 x 4)	1 (1 x 4)	2 (1 x 6, 1 x 4)	1 (1 x 4)	1 (1 x 4)	1 (1 x 4)	1	1 (1 x 4)	1 (1 x 4)	1 (1 x 4)	1 (1 x 4)
Pointing device	Touchpad	Touchpad with scroll buttons	Touchpad with scroll buttons	Touchpad	Touchpad with scroll buttons	Touchpad	Touchpad with directional scroll buttons	Touchpad with scroll buttons	Touchpad	Touchpad with directional scroll buttons and stylus	Touchpad	Touchpad with scroll buttons
TV-out	Yes	None	None	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Serial	None	None	None	1	None	None	None	None	None	None	1	None
Parallel	None	1	1	1	None	None	1	1	None	Yes	1	1
VGA-out	1	1	1	1	1	1	1	1	1	1	1	1
PCMCIA slots	1	1	1	1	2	None	1	2	1	1	2	1
Card reader	None	None	None	None	None	None	Secure Digital, Memory Stick	Secure Digital	None	Secure Digital	None	None
Controller	SiS 7012	SigmaTel C-Major	SiS 7012	Realtek AC'97	ALI M5451	(Not specified)	Avance AC'97	Yamaha YMF753	SigmaTel C-Major	Crystal WDM AC'97	ALI M5451	Avance AC'97
Battery capacity (hours)	3h	4h	3h	No battery	3.6	5	2	2.5	2.5	4	3.6	2
Warranty	1 year return to base	2 year onsite	1 year return to base	1 year return to base	1 year return to base	1year return to base	1year return to base	1 year return to base	1 year onsite	1 year onsite	1 year return to base	2 year return to base
Weight	3.0kg	2.27kg	2.2kg	6.4kg without battery	2.97kg	2.1kg	2.9kg	3.4kg	3.54kg	2.59kg	2.97kg	3.8kg

	Dell Latitude E5500	IBM ThinkPad L440	Optima Centrino 8	Fujitsu CELSIUS H700	Fujitsu LifeBook E8010	Dell Inspiron 8600	BenQ Joybook 8600	NEC S500	NEC LiveHat	Sony VAIO VGN-FZ	IBM X40	HP EliteBook	Toshiba Portege R100	Fujitsu LifeBook S6420	Dell Inspiron 8600	Apple PowerMac G5 (1.8GHz)	Apple PowerMac G5 (2.0GHz)	Apple PowerMac G5 (2.3GHz)	Acer Aspire 8930-CCP	Fujitsu LifeBook E8410	Fujitsu LifeBook S6520	Acer Aspire 8930-CCP
$3,499	$3,499	$3,499	$3,499	$3,595	$3,699	$3,799	$3,999	$3,999	$3,999	$3,999	$4,199	$4,295	$4,399	$4,400	$4,499	$4,595	$4,699	$4,699	$4,699	$4,899	$5,162	$5,720	$5,799	$5,999	$5,999	$6,299
Pentium M 1.30GHz	P4 3.00GHz	Pentium M 1.60GHz	P4 3.06GHz	Pentium M 1.60GHz	P4-M 2.40GHz	P4-M 2.40GHz	P4-M 1.80GHz	Pentium M 1.30GHz	P4-M 933MHz	P4-M 2.20GHz	Pentium M 1.50GHz	P4-M 2.00GHz	P4-M 3.06GHz	Pentium M 900MHz	Pentium M 900MHz	P4-M 2.50GHz	Pentium M 1.40GHz	P4-M 1.80GHz	P4-M 2.40GHz	Pentium M 1.60GHz	Pentium M 1.60GHz	Pentium M 1.60GHz	Pentium M 1.60GHz	Pentium M 1.60GHz	PowerPC G4 1.00GHz
i855GM	i855PM	i855PM	5064/5TK	i855GM	i845GV	ATi RS200M	ALI M1671	i855GM	ALI M1644	i845MP	i855PM	i845MP	i845MP	i855PM	i855GM	i845MP	i855GM	ATi RS200M	i845MP	i855PM	i855PM	i855PM	i855GM	i855GM	i855GM	Intrepid
512MB	256MB	256MB	256MB	512MB	512MB	256MB	256MB	256MB	256MB	256MB	512MB	256MB	256MB	256MB	512MB	1024MB	512MB	1024MB	512MB	256MB	512MB	512MB	512MB	256MB	512MB	512MB
i82855GM (Shared)	i82855GM (Shared)	Mobility Radeon 9000 (64MB)	Mobility Radeon 9000 (64MB)	i82855GM (Shared)	GeForce4 420 Go (64MB)	Radeon IGP 340M (Shared)	GeForce4 420 Go (32MB)	Mobility Radeon 9000 (32MB)	Trident Cyber-9525DVD ALADDIN-T (Shared)	Mobile Radeon (16MB)	Mobility Radeon 7500 (32MB)	Mobility Radeon 7500 (32MB)	Mobility Radeon 9000 (64MB)	Trident Cyber-XP4 m32 (32MB)	i82855GM (Shared)	GeForce4 440 Go (64MB)	i82855GM (Shared)	Radeon IGP 340M (Shared)	Mobility Radeon 7500 (32MB)	GeForce4 420 Go (32MB)	Mobility Radeon 9000 (64MB)	Mobility Radeon 9000 (64MB)	i82855GM (Shared)	i82855GM (Shared)	GeForce4 440 Go (64MB)
14.1in 1,024 x 768	15in 1,400 x 1,050	15in 1,024 x 768	14.1in 1,024 x 768	15.4in 1,680 x 1,050	14.1in 1,024 x 768	15.4in 1,024 x 854	12.1in 1,280 x 768	10.4in 1,024 x 768	12.1in 1,024 x 768	10.4in 1,024 x 768	14.1in 1,024 x 768	14.1in 1,024 x 768	15in 1,400 x 1,050	12.1in 1,024 x 768	10.4in 1,024 x 768	15.2in 1,280 x 854	12.1in 1,024 x 768	15in 1,400 x 1,050	15.4in 1,680 x 1,050	15.1in 1,400 x 1,050	15.1in 1,400 x 1,050	13.2in 1,024 x 768	17in 1,440 x 900
40GB	40GB	30GB	40GB	60GB	40GB	20GB	30GB	40GB	20GB	40GB	40GB	60GB	60GB	40GB	40GB	60GB	60GB	40GB	40GB	60GB	60GB	60GB	30GB	40GB	60GB	80GB
24/24/10x CD-RW/8x DVD-ROM	24/24/10x CD-RW/8x DVD-ROM	24/24/10x CD-RW/8x DVD-ROM	24/24/10x CD-RW/8x DVD-ROM	24/24/10x CD-RW/8x DVD-ROM	24/24/10x CD-RW/8x DVD-ROM	4/4/4x CD-RW/8x DVD-ROM	24/24/10x CD-RW/8x DVD-ROM	None	24/16/10x CD-RW/8x DVD-ROM	8x DVD-ROM	24/10/8x CD-RW/8x DVD-ROM	24/24/10x CD-RW/8x DVD-ROM	None	External IEEE1394 24x/10x/8x CD-RW/8x DVD-ROM	Powered-USB External 24x/24x/10x CD-RW/8x DVD-ROM	24/16/10x CD-RW/8x DVD-ROM	24/10/8x CD-RW/8x DVD-ROM	24/24/10x CD-RW/8x DVD-ROM	24/24/10x CD-RW/8x DVD-ROM	24/24/10x CD-RW/8x DVD-ROM	24/24/10x CD-RW/8x DVD-ROM	24/24/10x CD-RW/8x DVD-ROM	8x/8/4x DVD-RW
None	Yes	None	Yes	None	None	None	None	None	None	None	None	None	None	None	None	None	Yes	None	None	None	None	None	None	None	None
Win XP Pro	Win XP Pro	Win XP Pro	Win XP Home	Win XP Pro	Win XP Pro	Win XP Pro	Win XP Pro	Win XP Pro	Win XP Pro	Win XP Pro	Win 2000 Pro	Win XP Pro	Win XP Pro	Win XP Tablet Ed.	Win XP Tablet Ed.	Win XP Home	Win XP Home	Win XP Home	Win XP Home	Win XP Pro	Win XP Pro	Win XP Pro	Win XP Pro	Win XP Pro	Mac OS X v10.2
Conexant D480 MDC (V.92)	Agere Systems AC'97 (V.90)	Agere Systems AC'97 (V.90)	SmartLink SWLT(V.90)	Agere Systems AC'97 (V.90)	PCTEL 2304IBT MDC (V.92)	Lucent AMR (V.90)	Ali H5P65 MR(V.90)	National Semi. IS'r 100Ease	Conexant SmartAMR (V.90)	CXT AC-Link (V.90)	Agere Systems AC'97 (V.90)	Lucent AMR (V.90)	Toshiba AMR (V.90)	Agere Systems AC'97 (V.90)	ALi H5P56 MR(V.90)	Conexant D480 MDC (V.92)	Lucent AMR (V.90)	Conexant D480 MDC (V.92)	Toshiba AMR (V.90)	Agere Systems AC'97 (V.90)	Conexant D480 MDC (V.92)				
Intel PRO/ 100 VE 10/ 100Base-T	Broadcom 440x 10/ 100Base-T	Realtek RTL8139 10/ 100Base-T	Intel PRO/ 100 VE/ 100 VM 10/ 100Base-T	Broadcom 440x 10/ 100Base-T	Realtek RTL8139 10/ 100Base-T	National Semi. IS'r 100Ease	Intel PRO/ 100 VE 10/ 100Base-T	Realtek RTL8139 10/ 100Base-T	Intel PRO/1000 10/100/ 1000Base-T	Intel PRO/ 100 VE (V.90) 10/ 100Base-T	Intel PRO/ 100 VE 10/ 100Base-T	Realtek RTL8139 10/ 100Base-T	Intel PRO/ 100 VE 10/ 100Base-T	Intel PRO/ 100 VE 10/ 100Base-T	Realtek RTL8139 10/ 100Base-T	Broadcom 570x 10/100/ 1000Base-T	Broadcom 440x 10/ 100Base-T	Realtek RTL8139 10/ 100Base-T	Intel PRO/ 100 VE 10/ 100Base-T	Broadcom 440x 10/ 100Base-T	Realtek RTL8139 10/ 100Base-T	Realtek RTL8139 10/ 100Base-T	(10/100/ 1000Base-T)
Dell True-Mobile 1300 (802.11b/g)	High Rate (802.11b)	Intel PRO/ Wireless 2100 (802.11b)	NetMedia USB300 (802.11b)	Intel PRO/ Wireless 2100 (802.11b)	Dell True-Mobile 1300 (802.11b/g)	Intersil PRISM (802.11b)	None	Intel PRO/ Wireless 2100 (802.11b)	UGJZ (802.11a/b)	LAN-Express BSE (802.11b)	Intel PRO/ Wireless 2100 (802.11b)	None	Intel PRO/ Wireless 2100 (802.11b)	Intel PRO/ Wireless 2100 (802.11b)	Intersil PRISM (802.11b)	Dell True-Mobile 1300 (802.11b/g)	Intersil PRISM (802.11b)	LAN-Express BSE (802.11b)	Dell True-Mobile 1300 (802.11b/g)	Intel PRO/ Wireless 2100 (802.11b)	Intel PRO/ Wireless 2100 (802.11b)	Intel PRO/ Wireless LAN 2100 (802.11b)	Intel PRO/ Wireless 2915ABG Adapter	Apple Airport Extreme (802.11b/g)
Yes	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	Yes	None	None	None	None	None	Yes	Yes	Yes
Yes	None	Yes	Yes	None	Yes	Yes	Yes	None	None	None	Yes	Yes	None	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2	4	4	3	3	3	2	4	3	3	2	2	2	4	2	2	2	2	4	4	3	3	4	2	2	2	2
None	None	1 (3 x 4)	1 (1 x 4)	1 (3 x 4)	1 (1 x 4)	None	2 (1 x 4)	1 (1 x 4)	None	1 (1 x 4)	None	None	1 (3 x 4)	None	1 (1 x 4)	1 (3 x 4)	1 (1 x 4)	1 (3 x 4)	1 (1 x 4)	None	1 (1 x 4)	None	None	1 (1 x 4)	2 (1 x 6, 1 x 4)	
Touchpad	Track stick	Touchpad with scroll buttons	Touchpad with scroll buttons	Touchpad	Touchpad and track Stick	Touchpad with scroll buttons	Touchpad with scroll buttons	Touchpad with scroll buttons	Stylus	Touchpad	Touchpad and track stick	Touchpad and track stick	Touchpad with scroll buttons	Touchpad	Touchpad with scroll buttons & status	Touchpad	Touchpad and track stick	Touchpad with scroll buttons	Touchpad with directional scroll buttons	Touchpad and track stick	Touchpad and track stick	Touchpad with directional scroll buttons	Touchpad with scroll buttons	Touchpad with directional scroll buttons	Touchpad
Yes	None	Yes	Yes	None	Yes	Yes	Yes	None	None	Yes	Yes	None	None	None	None	None	Yes	None	Yes	Yes	Yes	Yes	Yes	None	Yes	
1	1	None	1	None	1	1	1	None	None	None	1	None	None	None	None	None	1	None	1	None	1	None	1	None	None	
1	1	1	1	1	1	None	None	None	1	1	None	1	None	None	1	None	1	1	1	1	1	1	None	None	None	
1	1	1	1	1	1	1	1	1	1	1	None	1	1	None	1	None	1	1	1	1	1	1	1	1	1	
1	1	1	1	1	2	1	2	None	1	2	2	1	1	None	1	None	1	1	2	1	2	1	1	2	1	
None	None	Smart Media, Memory Stick		None	None	None	None	Compact Flash	Stick	Memory Stick	None	None	SD	None	None	None	SD, Smart Media, Memory Stick	None	SD, Memory Stick	Smart Media, Memory Stick	None	SD, Smart Media, MMC, Memory Stick	None	SD, Smart Media, MMC, Memory Stick	None
SigmaTel C-Major	Sound-MAX Integrated Digital	Realtek AC'97	Realtek AC'97	Realtek AC'97	SigmaTel C-Major	SigmaTel C-Major	ALi M5451	Analog Devices 1981B	ADI 1981	YAMAHA AC-XG	Sound-MAX Integrated Digital	Sound-MAX Integrated Digital	Avance AC'97	AD 1981B	Crystal WDM AC'97	Realtek AC'97	SigmaTel C-Major	SigmaTel C-Major	Realtek AC'97	SigmaTel C-Major	Yamaha AC-XG	Realtek AC'97	SigmaTel C-Major	SigmaTel C-Major	(Not specified)
3	2	5	2.5	4	3.5	2.5	3.5	4	3	5	4.9	4	2.5	6.5 lw/ extended battery)	5	2.2	3	3	3.5	3.5	5	5.5	3.5	3.7	4.5
1 year onsite	1 yr pickup, repair and delivery	1 year return to base	1 year onsite	2 year return to base	1 year onsite	1 year return to base	1 yr pickup, repair and delivery	1 year return to base	Tyr; 3 month mem return to base	3 yr pickup, repair and delivery	3 yr pickup, repair and delivery	1 year onsite	1 year return to base	1 year return to base	2 year return to base	2 year onsite	1 year return to base	1 year return to base	1 year onsite	1 year return to base	1 year onsite	1 year return to base	1 year return to base	1 year return to base	
2.17kg	4.04kg	2.45kg	3kg	2.2kg	2.94kg	3.1kg	3.25kg	2.04kg (with weight saver)	1.02kg (with WLAN)	2kg	2.22kg	2.2kg	3.7kg (no battery)	1.45kg	2.7kg	1.69kg	3.6kg	2.68kg	2.72kg	3.0kg	2.48kg	3.1kg	1.75kg	3.1kg	

Screen idols

If you're not rushing to join the LCD brigade, a 17in or 19in CRT can be a smart and very affordable upgrade.

***Matt Overington, Paul Robinson* and *Jarrod Spiga* report.**

There's no argument: LCD panels are far sexier than CRT monitors. So given this, why do many people still have a conventional display planted on their desk?

Professional designers and graphic artists champion the Cathode Ray Tube because most offer a far finer degree of control over colour balance and brightness settings than the LCD units.

As an added bonus, CRTs can easily switch resolutions and suit a range of users, from those with failing eyesight to teenagers favouring myopic fonts to gain maximum on-screen real estate.

Furthermore, a TFT panel can't operate effectively outside its native resolution. This superior adjustability, and the ability to make resolution adjustments while maintaining picture quality, help maintain the CRT's popularity.

But by far the most obvious benefit of opting for a standard monitor is the cost. An entry-level 17in LCD monitor will set you back around $800. Yet for half that you can score a CRT unit with an equivalent viewable area.

The remaining $400 could then buy you a truckload of RAM, a mammoth new hard drive or six month's worth of broadband access. Or, just pocket the savings.

It's also worth noting that the trend away from fishbowl-shaped shadow mask tubes in favour of flat screen CRT displays is very noticeable. A few years ago shadow mask units were the norm but, as a reflection of today's market, there's a balanced mix here in this roundup.

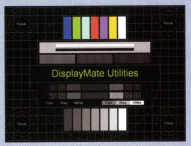
We're not asserting that CRT is for everyone. They draw more power and occupy greater desk space than their slim-line counterparts. And athough improvements to tube technology has shortened the length and depth of most units, they're still bulky beasts.

With affordability in mind, we set this Labs Challenge with a maximum price point of $399 for 17in CRT models and $699 for the 19in versions.

How we tested

Monitor testing is always an arduous process. After benchmarking all 16 monitors, using a standard procedure to ensure fairness and consistency across the board, we're ready to head to the optometrist. We constructed two identical test benches, running off Dell Inspiron 500m notebooks equipped with Radeon 9000 graphics chips. To these units we connected each monitor, one at a time, and ran them through DisplayMate at the maximum resolution each unit was capable of reproducing.

DisplayMate is one of the most in-depth and straining test packages we employ in the lab. Although it's a relatively aged application, dating back to the late 90s, it remains the most comprehensive monitor benchmark on the market.



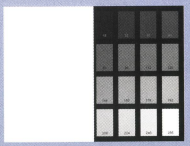
It throws a series of specialised tests at the screen, instructing the tester to make adjustments and notes as necessary. The entire myopia-inducing process takes over an hour.

The first major test measures video bandwidth by monitoring the reproduction of high and low frequency signals, corresponding to broad and fine detail. A value of 100 is perfect, but unachievable. A score in the range of 75-95 is considered optimal for most of the units in this review, with almost all falling within that range.

A series of moiré tests follow, where a series of grids display onscreen and the tester has to make fine adjustments to eliminate any effects. Any signs of moiré attract negative points.

AVERAGE PICTURE LEVEL

A common flaw held by most CRTs is the tendency for brightness in one area of the screen to affect the brightness in another. This is commonly detected in Average Picture Level (APL) testing. This benchmark displays a grid of rectangles of varying brightness levels across the entire screen, while alternating the right side of the screen from black to white to change the APL. The optimum result is for each rectangle to remain stable onscreen at a constant intensity, but very few units are capable of achieving this mark.



GAMMA

The range of a greyscale from black to white is registered in a gamma index.

Monitors with a high gamma index have finer control over the shade output, as they can output a wider range of shades between pure black and white. The average Gamma for a high-end CRT is around 2.5, however, very few attain near that mark under our tests.

Colour registration, beam alignment, image distortion, focus and sharpness are also key benchmarks conducted during the suite of tests. The complete list is extensive and impossible to cover in detail, but for more information on DisplayMate and its uses, head over to **www.displaymate.com**.





Philips 17
107T5

A compact CRT, flat screen and energy-efficient output are just two of the reasons why the Philips 107T5 stands head and shoulders above the other 17in screens in this roundup.

The 16in viewable screen sits just 40cm from the back of the monitor, making this the thinnest 17in unit in the pack. Because the electrons have to travel only a short distance to hit the phosphor elements on the 0.25mm aperture grille, the unit uses just 68W of power. The small size also means reduced weight; an easily carried and installed 15.5kg.

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Image quality is high across all resolutions, with a rated maximum of 1,280 x 1,024 at 60Hz. Colour appears pure across the screen, with no halos or streaking under the test conditions or normal use.

Our rigorous DisplayMate tests reveal only minor deficiencies. Screen contrast wasn't up to that of other tested CRTs, so distinguishing between some of the darker shades was difficult.

However, minimal changes of block intensities with backgrounds of varying shades indicate outstanding gaming performance. We even cranked a few rounds of Wolfenstein 3D in the name of testing.

There are slight focus imperfections in the screen's extreme corners due to the red, green and blue phosphor elements not completely lining up with each other. These are only noticeable under lab conditions designed to make such faults apparent — they're undetectable under gaming and general use.

Brightness and contrast settings are accessible at a touch, and the four onscreen display (OSD) controls are simple to use. Almost all functions you could want to access are in the OSD, except an auto setup feature.

At $299, the 107T5 is in the middle price bracket for 17in flat-screen CRTs.

Supplemented with a three-year onsite warranty, its size, power consumption and image quality make it a wise purchase for those who don't need a huge screen or baulk at the cost of an LCD.

Details	
Contact	Philips
Phone	(02) 9947 0000
Online	www.philips.com.au
Price	$299
✔	Gamma performance; size.
✖	Slight imperfections in image quality.
Verdict	●●●●◐

BenQ 19
P992

Aimed at the mid- to high-end user, the BenQ P992 has excellent picture quality at an affordable price. With a dot pitch of 0.25mm and a maximum resolution of 1,600 x 1,200, it's kitted out as well as any other 19in monitor in this roundup.

The only problem is that at its highest resolution, the refresh rate drops to 78Hz. But decreasing the resolution to 1,280 x 1,024 gets it humming along at a more respectable 85Hz.

apc EDITOR'S CHOICE AUG 2003

Refresh rates aren't everything though. Straight from the box, the BenQ P992 displays a clear, crisp image with minimal moiré patterns. After a slight tweak using the straightforward OSD to adjust screen size, it's ready to go.

The P992 performes amiably under DisplayMate, and gives outstanding results in other benchmarks. We did notice a few glitches and slight intensity changes under the Average Picture Level (APL) benchmark, but these are minor. One of the most impressive results came from the image-shifting tests, where a portion of the screen switches from high- to low-intensity output. It's common for the various intensities to shunt the rest of the onscreen image slightly left or right, but the P992 is rock steady.

Colour intensity tests result in perfect, constant colour scales across the spectrum, which will appeal to graphic artists. Convergence tests are favorable with fairly tight beams. The red is slightly out of alignment at the extreme edges of the screen, however, it is barely detectable.

The P992 eats up to 110W of power, only 10W more than the most efficient 19in unit in this roundup, and the modest $499 price should offset any power bill increase.

Although the unit omits future-proofing features such as a DVI-I connector or USB hub, it has a great display. The minimal problems detected during the strenuous DisplayMate tests are unlikely to be of concern during everyday use.

The BenQ P992, balancing performance and price, is a great addition to any computer system.

Details	
Contact	BenQ Australia
Phone	(02) 9714 6800
Online	www.benq.com.au
Price	$499
✔	Image quality.
✖	No future-proofing.
Verdict	●●●●◐

Acer AC901 19"

This 19in unit is good value for most consumers, even though it's recommended for business.

The monitor accepts D-Sub and composite BNC inputs, has a great video bandwidth of 202MHz and is capable of displaying 1,600 x 1,200 at an eyestrain-free 75Hz.

The ordinary-looking beige box sports four buttons controlling OSD functions via a fairly intuitive menu. Brightness and contrast settings are accessible at a touch. Using these settings, we were unable to distinguish between some grey tones approaching black. The contrast performance is acceptable, but not as good as many other screens in this Labs Challenge.

We also encountered slight discolouration on the right side of the screen. Red colours appeared to be duller on this side, with some blurring from slight misalignment.

Some moiré appears over certain dithered blocks, but we were able to remove most of it with the OSD's moiré adjustment controls.

Weighing 20kg, the unit isn't too heavy for lifting, but standing 47cm deep it's quite bulky and takes up plenty of landscape on the desk. The swivel base is a plus, allowing 90 degrees of directional flexibility.



Details	
Contact	Acer
Phone	1300 366 567
Online	www.acer.com.au
Price	$399
✔	Minimal moiré after adjustment; video bandwidth.
✖	Slight discolouration and focus problem on right side.
Verdict	●●●●○

ADI P950 19"

With a footprint of 44.6 x 46.4cm, ADI's 19in hulk needs plenty of desk space. And if you're fussy about what tube is in the case, there's element of potluck here, as ADI uses either Samsung or LG tubes (subject to availability).

With a maximum resolution of 1,600 x 1,200 at 85Hz, ADI recommends throttling back to 1,280 x 1,024 using the same refresh rate. With a dot pitch of 0.25mm and 261MHz of video bandwidth, the image quality should be sharp and error free, and to an extent it is.

The P950 has an accurate focus, good convergence and no signs of ghosting streaks. However, DisplayMate tests reveal image abnormalities.

There is some loss of intensity in the reds at the very edge of the display, which means there are dull areas when viewing a white screen. Also, screen edges and convergence are slightly unfocused.

The intensity and image position remain constant throughout APL checks, which is rare among the tested monitors.

Unfortunately, this doesn't make up for the disappointing P950 monitor's geometry issues.



Details	
Contact	Wholesales
Phone	(08) 9249 3028
Online	www.wholesales.com.au
Price	$440
✔	Central focusing.
✖	Dimensions.
Verdict	●●○○○

ADI V77F 17"

With a rock bottom price of $229, the V77F is the cheapest 17in flat-tube monitor in this roundup. Aimed at the home or small business market, it also offers reasonable performance.

Capable of 1,280 x 1,024 at 60Hz, this 0.25mm dot pitch monitor is best viewed at 1,024 x 768 at 85Hz. However, it seems to suffer similar problems to the P950 monitor — the right-hand third of its display appears consistently taller than the rest.

Also, DisplayMate testing shows considerable fluctuations of intensity, with blocks darkening when the APL increases.

There are also ghost or streaking effects when a dark area is displayed on a white background. Convergence testing revealed the blue colour beam was out of alignment with the other two colours, and there's evidence that the image is unfocused on the right side of the screen. The adequate OSD is unable to correct slight, but noticeable, moiré patterns, and high-contrast patterns have halos.

In its target market, this monitor does well enough for its budget price, although you'll probably need a bigger desk to accommodate its 49 x 54cm footprint.

Graphics work notwithstanding, this screen should meet most other needs.



Details	
Contact	Wholesales
Phone	(08) 9249 3028
Online	www.wholesales.com.au
Price	$229
✔	Cost-effective.
✖	Bulky.
Verdict	●●●○○

AOC 9Klr

This is one power-hungry monitor. AOC's 19in tube needs 130W to display images at up to 1,600 x 1,200 at 75Hz. But at 20kg, it's also one of the lighter units for its size, and the base's design means adjusting the angle and direction of the flat screen requires just a gentle touch.

With an aperture grille pitch of 0.25mm and a viewable image size of 18in, we were expecting value for money. Unfortunately, displayed image quality fell short. APL tests show significant changes in pixel intensity and position when light and dark backgrounds were compared.

The 9Klr has noticeable striping and focus problems. These make black lines appear grey and edges seem blurred. Halos are visible around high-contrast blocks, as is a slight discolouration on the edge of the screen.

But it isn't all doom and gloom — when moiré patterns appear, the OSD controls compensate and eliminate them. OSD options are selected by rotating and pushing in a wheel on the front of the monitor.

All basic OSD functions are present, although the lack of vertical pin-cushioning controls prevent us from having straight edges at the top and bottom of the screen.



Details	
Contact	Morning Star
Phone	(03) 9874 1066
Online	www.morning-star.net.au
Price	$399
✔	Affordable.
✖	Picture setup; APL performance; focus; power consumption.
Verdict	●◐○○○

AOpen A70e

This 17in shadow mask screen is AOpen's only representative in this Labs Challenge, and given its bargain-basement price of $210, it's not a bad buy.

With a maximum resolution of 1,280 x 1,024 at 72Hz, pixels display over a 15.8in viewable surface through a 0.27mm aperture grille.

Weighing 16kg and drawing 100W of power, the specs are average for the cheaper screens of this size.

In the lab, we discovered inconsistent shade intensities when bright backgrounds are used. The pixels move dramatically, depending on the brightness of the display.

Some were displaced up to 4mm when changing from light to dark backgrounds. Focus problems are evident around the screen edges and fonts smaller than 10-point are particularly difficult to read. This is due to the three colour components being slightly out of alignment close to the screen's edge.

Some moiré appears over dithered patterns, and the simple OSD controls can't rectify this.

These blemishes aside, the picture that's displayed is mainly consistent in colour, sharp in the centre, free from flickering and in proper aspect.



Details	
Contact	BlueChip IT
Phone	(02) 8745 8400
Online	www.bluechipit.com.au
Price	$210
✔	Price; colour.
✖	Focus in corners; picture-level fluctuations.
Verdict	●●●○○

BenQ G774

The G774 offers better image quality than other monitors tested, despite problems highlighted by DisplayMate. It displays good contrast levels and aspect ratios, and also boasts a high level of sharpness and focus across the full screen.

However, the straightforward OSD is unable to correct considerable moiré patterns present on certain screens, and there's some slight discolouration around the edges.

There are halos above high-contrast objects, and reflections of some bright images on dark backgrounds can be seen from the screen's many layers.

The display has 1,280 x 1,024 pixels at a steady 67Hz. BenQ recommends running it at 1,024 x 768, thereby refreshing at a zippier 85Hz. With a 0.25mm dot pitch, the monitor is about as power-friendly as they come, needing a maximum of 75W — second only to the 68W drawn by the Philips 107T5.

BenQ has aimed this monitor at the home-user market, and at just $269, it's cheaper than most of the 17in monitors in this roundup.

With its great value, it shouldn't be overlooked when you're searching for your next 17in screen.



Details	
Contact	BenQ Australia
Phone	(02) 9714 6800
Online	www.benq.com.au
Price	$269
✔	Sharpness.
✖	Jumpy images.
Verdict	●●●◐○

HP Compaq s7500 17

Hewlett-Packard's entry into the 17in category (it also has 15in and 19in versions of this screen) is the shadow mask-tubed S7500. It's equipped with a 0.28mm aperture grille and runs at a maximum resolution of 1,280 x 1,024 at 60Hz.

The image is rendered blurry, thanks to the large dot pitch, and focus is lacklustre around the edges and corners of the screen.

The OSD is kludgy and difficult to use, while the circular layout of menu options is confusing.

Some areas on the screen appear darker than others in a few of the DisplayMate tests. This is particularly noticeable in the top-right corner, where reds are washed out; and the bottom-left, where greens and blues appear pale.

APL tests reveal intensity changes in the gradient blocks and then in the background a fraction of a second later, which is most unusual.

A gamma measurement of 1.96 is considerably lower than 2.4 — the figure that should be standard for CRTs.

At $425, this is not the cheapest screen available in the 17in category, although the three-year limited, one-year onsite warranty will reassure buyers.

Overall, picture quality is reasonable for productivity purposes.



Details	
Contact	Hewlett-Packard
Phone	1300 305 018
Online	www.hp.com.au
Price	$425
✔	Interesting colour scheme.
✖	Colour purity; intensity fluctuation; price.
Verdict	●●◐○○

Hyundai 19
ImageQuest Q910

Hyundai's 19in monitor is a head-turner, but looks aren't everything and this unit has one or two display imperfections.

The 18in viewable screen is capable of 1,600 x 1,200 pixels at a refresh rate of 85Hz.

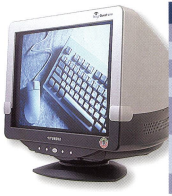
The 0.25mm aperture grille pitch assures good picture quality, while a gamma rating of 2.25 means the screen throws plenty of light for use in bright environments.

One of the first things we noticed in our tests was slight vertical barrelling, which can't be adjusted due to the lack of vertical aspect controls in the OSD.

There is a slight variation in pixel location with images of various intensities, and also colour impurities in the top-left and bottom-right corners. This is particularly evident with the red and blue palettes.

Image streaking is noticeable under high-contrast testing and very slight beat patterns can be seen in moiré tests. Focus is good but there is some minor blurring in the corners of the viewable area.

But these negative observations are hardly noticeable under the demands of normal use.



Details	
Contact	Synnex
Phone	1300 880 038
Online	www.synnex.com.au
Price	$459
✔	Picture quality; refresh rates and gamma.
✖	No vertical aspect controls; slight colour impurities.
Verdict	●●●◐○

IBM E74 17

Aimed at users wanting a budget monitor capable of meeting word-processing or spreadsheet needs, the E74 has a maximum resolution of 1,280 x 1,024 at 60Hz.

Due to this low refresh rate, the monitor performs optimally at 1,024 x 768 at a more pleasing 85Hz.

And with a footprint of 40 x 41cm, the E74 takes up less desk space than the Philips 107T5, though it has a longer picture tube.

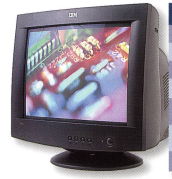
The DisplayMate tests highlight only minor issues. The intensity and position of the viewable image alters slightly when there are changes in the APL. For the target business market, this isn't a problem.

Convergence testing shows that the red beam is slightly out of alignment with the blue and green beams, but it isn't detectable in regular use.

Despite a whopping 0.27mm dot pitch, image quality is impressive and remains in focus, even at the edges.

Image intensity is uniform across the screen, as is theaspect ratio. A complete absence of moiré effects is a pleasant surprise.

Yes, cheaper 17in monitors are available. But the IBM E74 provides a good balance between price and performance for users with lower-end requirements.



Details	
Contact	IBM
Phone	13 24 26
Online	www.ibm.com.au
Price	$249
✔	Price; steady performance.
✖	RTB warranty.
Verdict	●●●◐○

LG Flatron F700P 17"

Aimed at the professional market, with a hefty price to match, the LG Flatron F700P is right on our price limit.

Featuring a four-port USB hub at the rear, the F700P bundles functionality with a quality 17in screen in a two-tone grey enclosure.

Capable of 1,600 x 1,200 at 75Hz, with an optimal resolution of 1,280 x 1,024 at 85Hz, this monitor has an ultra-fine 0.24 dot pitch — the smallest of all monitors tested in this roundup.

DisplayMate tests bring a few image defects to light. Full-screen tests show areas of low colour intensity at the top of the screen for green and top and bottom for red, producing noticeably dull white images in those regions.

Intensity changes are evident during APL tests, with vast differences in the brightness of the test rectangles. Many of the monitors in this roundup shift the image under APL testing, but the F700P consistently keeps it in the same position and the same size.

The OSD controls are unable to correct a slight moiré effect produced by certain test patterns.

While this monitor is of quite good quality for everyday use, the intensity problems will probably have graphics professionals crossing it off their lists, especially at the price.



Details	
Contact	LG Electronics
Phone	1800 643 156
Online	www.lge.com.au
Price	$399
✔	Overall quality; USB hub.
✖	Intensity; price.
Verdict	●●●○○

Mitsubishi 19" Diamond View 1998FDB

This 19in CRT from Mitsubishi, designed for the home or small business, is capable of outputting at 1,280 x 1,024 at 85Hz. A maximum resolution of 1,600 x 1,200 at 75Hz can be achieved with its 0.25mm dot pitch tube, but text may be rendered too fuzzy for comfortable viewing.

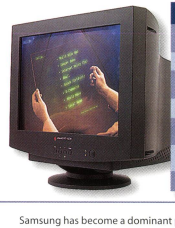
APL testing shows some image repositioning when a large section of the screen changes intensity and there is evidence of halos on a few test screens.

Convergence testing reveals the red colour beam to be slightly misaligned. Focus testing shows that the edges are slightly out, particularly with bright images.

Some moiré patterns were encountered, but the easy-to-use OSD compensates for them. The real disappointment is the slight upturning at the bottom corners, resulting in rounding that the OSD can't correct.

Contrast is quite good with the full range of test greyscale blocks easily distinguishable.

The 1998FDB also has one of the most uniform colour intensities across the spectrum of the monitors tested.



Details	
Contact	Mitsubishi Electric Australia
Phone	(02) 9684 7777
Online	www.mitsubishi-electric.com.au
Price	$299
✔	Contrast; colour uniformity.
✖	Image quality issues.
Verdict	●●●◐○

Samsung 19" Syncmaster 955DF

The 955DF monitor is the most expensive flat-screen 19in in this roundup. The 18in viewable screen features a dot pitch of just 0.20mm, and supports resolutions of up to 1,600 x 1,200 at 68Hz.

This SyncMaster's thick glass causes unique quirks. The image appears to be just over 1cm behind the front of the glass, causing reflections and an impression of double-vision.

DisplayMate results are average and some moiré problems can't be eliminated via the user-friendly OSD controls.

The colour purity is outstanding, but the screen geometry only rated an "acceptable" and we observed noticeable pixel shift in some APL tests.

Like its 17in counterpart, the 955DF has a "Highlight Zone" feature to increase brightness over the entire onscreen image or a portion of it. This feature causes some saturation of colours and light tones.

Samsung has become a dominant player in the monitor market in the past couple of years. Its products frequently ship with new PCs due to their consistent performance and competitive price.



Details	
Contact	Samsung
Phone	(02) 9763 9791
Online	www.samsung.com.au
Price	$599
✔	Aperture pitch; colour registration.
✖	Recessed image; moiré patterns; price.
Verdict	●●●○○

Philips 109S4

Here's an inexpensive, flicker-free monitor ideal for home users. Like Philips' 107T5, this offering is energy-efficient, sucking up just 83W.

The 18in viewable surface has an aperture grille of 0.27mm and displays resolutions up to 1,920 x 1,280 at 60 refreshes per second.

Image quality is high, and the screen is suitable for use in all but the brightest environments (such as in the lab, where we could see a little glare).

Colour replication is pure and even across the screen, but some beat patterns appear over dithered blocks that couldn't be eliminated with the moiré adjustment controls.

In high-contrast images there was a tiny bit of haloing and very slight shadowing. We also noted some intensity fluctuations with different background shades in APL tests.

The OSD contains all the controls that feature in Philips' 107T5 unit, but it's missing an auto setup feature.

Navigating through the OSD is straightforward, thanks to the addition of an extra control button; brightness and contrast adjustments can be made with a single touch.

The Philips 109S4 is one of the lower-priced 19in screens on the market and, overall, it's a good-value purchase for home or business users.



Details	
Contact	Philips
Phone	(02) 9947 0000
Online	www.philips.com.au
Price	$439
✔	High-res available; energy-efficient.
✖	Slight moiré, APL, haloing and streaking problems.
Verdict	●●●●○

Manufacturer	Acer	ADI	ADI	AOC	AOpen	BenQ	BenQ	HP
Model	AC901	P950	V77F	9Klr	A70e	G774	P992	S7500
Contact	Acer	Wholesales	Wholesales	Morning Star	BlueChip IT	BenQ Australia	BenQ Australia	HP Australia
Phone	(02) 8762 3000	(08) 9249 3028	(08) 9249 3028	(03) 9874 1066	(02) 8745 8400	(02) 9714 6800	(02) 9714 6800	1300 305 018
Online	www.acer.com.au	www.wholesales.com.au	www.wholesales.com.au	www.morningstar.co.nz	www.bluechipit.com.au	www.benq.com.au	www.benq.com.au	www.hp.com.au
Price	$399	$440	$229	$399	$210	$269	$499	$425
Tube technology	Flat	Flat	Flat	Flat	Shadow mask	Shadow mask	Shadow mask	Shadow mask
Tube manufacturer	Lite-On	Samsung/LG	Samsung/LG	AOC	Not disclosed	CPT	Samsung	Not disclosed
Size (in)	19	19	17	19	17	17	19	17
Viewable (in)	18	18	15.8	18	15.8	16	18	16
Aperture grille pitch (mm)	0.26	0.25	0.25	0.25	0.27	0.25	0.25	0.28
Maximum resolution	1,600 x 1,200 @ 75Hz	1,600 x 1,200 @ 85Hz	1,280 x 1,024 @60Hz	1,600 x 1,200 @ 75Hz	1,280 x 1,024 @ 75Hz	1,280 x 1,024 @ 67Hz	1,600 x 1,200 @ 78Hz	1,280 x 1,024 @ 60Hz
Optimal resolution	1,280 x 1,024 @ 85 Hz	1,280 x 1,024 @ 85Hz	1,024 x 768 @ 85Hz	1,280 x 1,024 @85Hz	1,024 x 768 @ 85Hz	1,024 x 768 @ 85Hz	1,280 x 1,024 @ 85Hz	1,024 x 768 @ 85Hz
Inputs	VGA (D-sub), 5xBNC RGB analog	VGA (D-sub), 5xBNC RGB analog	VGA (D-sub)	VGA (D-sub)	VGA (D-sub)	VGA (D-sub)	VGA (D-sub)	VGA (D-sub)
Horizontal scan (kHz)	30-95	30-107	30-70	30-95	30-70	30-72	30-98	30-70
Vertical scan (Hz)	50-160	50-150	50-160	50-160	50-120	50-120	50-160	50-140
Dimensions (WxHxD, cm)	45.2 x46 x46.8	44.6 x 46.5 x 46.4	49.4 x 46 x 54.5	44.6 x 43.6 x 45.5	40.4 x 40.8 x 42.3	40.6 x 42.3 x 41.2	45.5 x 46.6 x 46.3	41 x 43.2 x 44.5
Weight (kg)	20	21.3	14.5	20	16	16.4	21	17.3
Power usage (W)	100	110	100	130	100	75	110	100
Warranty	Three-year RTB	Three-year onsite	Three-year onsite	Three-year onsite	Three-year RTB	Three-year onsite pickup	Three-year onsite pickup	Three-year (one-year onsite pickup)
Rating	3.5	3	2.5	2.5	3	3.5	4.5	2.5
Comments	OSD intuitive; some black level, streaking, moiré and colour purity issues; slight blurring in corners; minimal APL issues; good geometry; no haloing.	Simplistic OSD; minor black level, moiré, red colour purity, geometry, and focus (especially in corners) issues; good APL performance; no streaking; gamma reading is a low; takes up a lot of space.	APL intensity and pixel shift troubles; considerable focus problems due to non-convergence of blue on right of screen; moiré, streaking, and halos also visible; large footprint; good gamma.	OSD easily allows moiré issues to be fixed; unresolved geometry problems; significant APL intensity and pixel shift issues; slight colour purity, focus, haloing and striping problems.	Simple OSD; slight APL intensity changes, and significant APL pixel shift; slight focus issues on edges of screen, as well as unfixable moiré issues; good colour purity; no streaking or haloing.	Straightforward OSD; APL intensities remain constant, though pixel shift is bad; haloing and reflections observed; slight colour impurities; good focus, geometry and sharpness.	No moiré; image focused over entire screen; slight intensity changes during APL testing; good colour intensity across spectrum; no future-proof features like BNC connectors.	APL intensity problems, however, different in that it's the background that changes intensity instead of the rectangles; slightly unfocused — only legible down to 7.5 point fonts; cumbersome OSD.

ViewSonic G90f+ 19"

Boasting a 45 x 46cm footprint, the ViewSonic G90f+ takes up less desk space than most 19in CRT monitors in this roundup. With an optional USB hub, it's aimed at home users looking for better performance without the ultra-high resolutions required by a graphics professional.

Capable of a maximum resolution of 1,600 x 1,200 at 77Hz, the optimal setting is 1,280 x 1,024 at 89Hz to reduce any flickering. The display has a dot pitch of 0.25mm — as small as they come among the 19in monitors tested.

The OSD is more complicated to navigate than need be, requiring more button presses to change settings than other monitors. Thankfully, it has two handy buttons to get you started, one that auto-calibrates the monitor to presettings and another for ultra-bright mode for video or game play.

DisplayMate tests reveal quality issues like blurring in the corners of the screen, although it is rare for a CRT to remain perfectly in focus at the edges.

Not completely free of moiré patterns, when they did occur, they were quite minimal.

Overall, the display isn't as good as might be expected, considering ViewSonic's reputation. But its image quality is still among the best in this roundup. The G90f+ costs a bit more than comparables, but it's still worth a look.



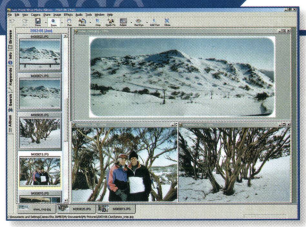
Details	
Contact	ViewSonic
Phone	(02) 9929 3955
Online	www.viewsonic.com.au
Price	$489
✔	Image quality.
✖	Complex OSD navigation.
Verdict	●●●●○

	Hyundai Q910	IBM E74	LG Flatron 700P	Mitsubishi DiamondView 1998FDB	Philips 107T5	Philips 109S4	Samsung 955DF	ViewSonic G90f+
	Synnex	IBM	LG Electronics	Mitsubishi Electric Australia	Philips	Philips	Samsung	ViewSonic
	1300 880 038	13 24 26	1800 645 156	(02) 9684 7777	(02) 9947 0000	(02) 9947 0000	(02) 9763 9791	(02) 9929 3955
	www.synnex.com.au	www.ibm.com.au	www.lge.com.au	www. mitsubishi-electric.com.au	www.philips.com.au	www.philips.com.au	www.samsung.com.au	www.viewsonic.com.au
	$459	$249	$399	$579	$299	$439	$599	$489.00
	Flat	Shadow mask	Flat	Flat	Flat	Shadow mask	Flat	Shadow mask
	Hyundai	AOC	LG	Not disclosed	Not disclosed	Not disclosed	Samsung	Delta
	19	17	17	19	17	19	19	19
	18	16	16	18	16	18	18	18
	0.25	0.27	0.24	0.25	1.25	0.27	0.2	0.25
	1,600 x 1,200 @ 85Hz	1,280 x 1,024 @ 60Hz	1,600 x 1,200 @ 75Hz	1,6 00 x 1,200 @ 75Hz	1,280 x 1,024 @ 60Hz	1,920 x 1,280 @ 60Hz	1,600 x 1,200 @ 68Hz	1,600 x 1,200 @ 77Hz
	1,280 x 1,024 @ 85Hz	1,024 x 768 @ 85Hz	1,280 x 1,024 @ 85 Hz	1,280 x 1,024 @ 85Hz	1,024 x 768 @ 85Hz	1,280 x 1,024 @ 85Hz	1,280 x 1,024 @ 75Hz	1,280 x 1,024 @ 89Hz
	VGA (D-sub)	VGA (D-sub)	VGA (D-sub)	VGA (D-sub)	VGA (D-sub)	VGA (D-sub)	VGA (D-sub)	VGA (D-sub)
	30-107	30-69	30-96	30-98	30-71	30-92	30-85	30-97
	50-150	50-130	50-160	50-160	50-160	50-160	50-160	50-180
	43.6 x 43.1 x 45.6	40 x 39.8 x 41.2	41.5 x 41.3 x 43.2	45.5 x 46.6 x 46.3	42.4 x 38.3 x 39.7	44 x 44.7 x 44	44 x 46 x 46	44.8 x 46.5 x 45.9
	20	15.5	17	20	15.5	19.4	21	22
	110	75	83	110	68	83	100	120
	Three-year onsite	Three-year onsite	Three-year RTB	Three-year onsite	Three-year onsite	Three-year onsite	Three-year RTB	Three-year RTB
	3	3.5	3.5	3.5	4.5	4	3.5	3.5
	Very slight image distortion during APL tests; slight colour variations in corners — primarily with blue and red; poor convergence with all three colours out of alignment and out of focus.	Small footprint; high-quality image with minimal convergence problems; uniform intensity across screen and good aspect ratio; slight overall intensity fluctuations and distortion during APL testing.	Expensive; good quality, high-performance monitor; integrated four-port USB hub; ultra-fine dot pitch; some intensity fluctuations during APL tests; OSD unable to correct moiré.	Blurry and discoloured corners; intensity changes during APL tests; some haloing on high contrast screens; optimal video bandwidth leads to overall good quality image.	Very compact and energy efficient; high overall picture quality; simple OSD navigation; minimal streaking and image slightly out of focus in corners.	Some intensity changes in APL testing, with blocks darkening when the average intensity increases; some halo and moiré effects which can't be corrected; colour convergence good.	Screen movement with intensity changes; no auto calibrate functionality; some flickering on the right-hand side of the screen; minimal moiré patterns	Small footprint; complex OSD but includes auto calibrate and ultra-bright modes; discolouration around edges; some blurring and halos.

Bonus CD software

GET THIS MONTH'S APC COVER CD

Jasc Paint Shop Photo Album 4, ACDSee 5.0, Adobe Photoshop Album, Imatch 3.3.0.1, SmartDraw Photo 2.0, Virtual Album.



Catalogue this!

Six image management applications get a sorting out from *Matt Overington* and *James Eke*.

Anyone with a digital camera or scanner soon runs into the problem of storing their pictures. Within a few months of picking up an imaging device, you'll have hard disks full of hi-res snaps. Unless you're extremely organised, these images stand a good chance of being scattered all over your system.

If you're right into digital photography, you'll need a management application that takes the pain out of tracking your snaps. Although current versions of Windows can display thumbnails in a folder view, they can't catalogue and organise pictures. And you can forget about searching based on subject descriptions.

The range of image management software on the market is wide (dare we say, panoramic!). Some users simply want to move and keep track of stored images; others need to perform basic manipulations such as colour correction and cropping. More powerful applications can help catalogue, arrange, email and print photos, and publish them on Web sites.

In this Labs Challenge, we look at six image management apps that perform some or all of these tasks. Each has been used to import, tweak and edit a variety of test snaps.

We deliberately included some poor-quality pictures to gauge each package's adeptness at dealing with photographers' mistakes. A number of our test images were overexposed, while others suffered from scratches and blurriness.

A few of the apps have automatic adjustment wizards to take the mystery out of adjusting colour, brightness and contrast. We compared one package's autocorrection capabilities against another's before repeating the same tests with the manual editing tools.

These suites have a wide range of features, and our Editor's Choice should completely fulfil your requirements for image editing and manipulation.

If you think you might be after something completely different — the features do vary widely — have a look at the demo versions on this month's cover CD set to find a package that suits. Check the CD icon (above) for the package demos.

Jasc Paint Shop Photo Album 4

apc EDITOR'S CHOICE AUG 2003

Jasc's entry is the surprisingly complete Paint Shop Photo Album 4. It ships with a massive list of features, from standard photo touch-up to emailing. It even burns slide shows to disc in VCD format.

One of its best assets is the creation of panoramas by stitching images together. The user selects the images, clicks the panorama button and Paint Shop takes care of the rest. Any overlapping is taken into account in producing a single seamless photo.

Photos can be stored in categories based on keywords such as "location" and "subject". Categories can easily be edited, and the quick, effective search engine is particularly handy if you have hundreds or thousands of photos to catalogue.

Photo touch-up can be done in three ways depending on how much fiddling you're up to. Users in a hurry can click the quick Fix button to automatically optimise brightness, colour and contrast.

A wizard caters for those who want finer control over image attributes but still want the software to handle most of the work. Designed for users inexperienced in imaging applications, it has a four-step process for adjusting colour, brightness, contrast and sharpness.

At each stage, three images are displayed onscreen — the original and two altered versions. In a "bracketing" style of operation, one image has less of an attribute, such as colour, while the other has more. You simply select the one that looks the best.

Or you can take total control with options for manually changing each attribute. A range of edge effects can be added, and the sepia function is handy for giving images that toned, aged look.

Many of this package's features can be found elsewhere. But its winning combination of options, free and unlimited technical support, and the unique, user-friendly touch-up and menu systems combine to make Paint Shop Photo Album 4 *APC's* Editor's Choice.

Details	
Contact	Communique
Phone	(02) 9622 5624
Online	www.comm-unique.com.au
Price	$89.95
✔	Easy to use; wizard-based.
✖	Constant tips become annoying.
Verdict	●●●●○

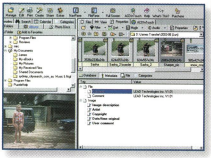
ACD Systems
ACDSee 5.0

ACD Systems' ACDSee 5.0 contains all the standard photo editing and touch-up tools to adjust colour, contrast, brightness and tone, along with effects such as sepia and pencil drawing.

Of all the packages in this roundup, ACDSee supports the most diverse range of formats; from the usual JPEG and BMP to some rarely used file types. A conversion facility makes it possible to edit and save almost any image format — which should appeal to Web graphics editors.

The biggest problem is too many menus and buttons. This tends to make navigation a little slow when searching for features and options, but once you gain a level of familiarity with the layout, the package's versatility becomes clear.

Having said that, most of its competitors employ superior menu systems.



That said, it's one of the most nimble image management packages available. And even though the search and cataloging features aren't as straightforward as some of the other packages, it's worth a closer inspection.

Email optimisation and the ability to burn CDs help ACDSee along, but its best asset is the wide-ranging file format support.

Details	
Contact	Pineapplehead
Phone	1800 657 601
Online	www.pineapplehead.com.au
Price	$129
✔	Wide-ranging file format support.
✖	Cluttered interface.
Verdict	●●●●○

Adobe
Photoshop Album

Adobe's entry-level image management application is a smart buy because it can sort large numbers of images and it performs basic manipulation.

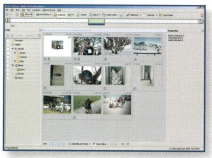
All the standard tools for touch-up colour, contrast, balance and brightness are present, along with a single-click fix feature. Four auto fixes correct colour, levels, contrast and sharpness. They do an acceptable job of marking up an image but can't match the human touch.

Photoshop Album employs a split-pane "before and after" arrangement during touch-ups, making it easy to compare changes to the original image.

Image sorting is done via keyword tags, and several tags can be attached to any one image to make searches more thorough. The effectiveness of this depends on the amount of time you're willing to spend creating the tags, but it's clearly one of the best image sorting methods available.

Users can also create calendars and slide shows, and burn their images on to CD.

So if you're looking for a package that combines a lot of options with excellent ease-of-use, Photoshop Album is hard to beat.



Details	
Contact	Adobe
Phone	1300 550 205
Online	www.adobe.com.au
Price	$99
✔	Easy editing.
✖	Could have extra features.
Verdict	●●●●○

Photools
Imatch

Photools Imatch is the most disappointing package in this Labs Challenge. It's not user-friendly and relies on menus rather than icons. This makes editing harder than it should be, despite the inclusion of adequate features to add descriptions and categorise photos.

Photo editing tools aren't abundant, but Imatch does have the standard range of features to tweak colours, contrast, balance and sharpness.

Accidentally deleting pictures from your hard disk is all-too-easy because the application doesn't clearly state that removing an image from an album trashes the file.

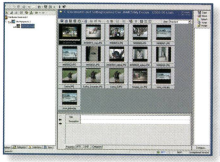
And Imatch falls short when it comes to constructing photo albums, too.

One of the most frustrating aspects of this package is the pop-up tips; you can't completely disable them and they become a constant annoyance as a result.

Tips designed to help overcome the clumsy interface have the opposite effect and make it even harder to use.

In Imatch's favour is its categorisation of photos; once photos are assigned a category, sorting and searching becomes quite simple.

However nothing can take away from the unfriendly interface and lack of basic editing tools, which make Imatch's software truly second rate compared to the rest of this Labs Challenge.



Details	
Contact	Photools
Online	www.photools.com
Price	US$50
✔	Easy sorting.
✖	Constant, unavoidable tips.
Verdict	●●○○○

SmartDraw Photo 2.0

Yes it lacks the polish of Adobe Photoshop Album or Jasc Paint Shop Photo Album, but SmartDraw is still a great product.

When you launchthe software, it searches the hard disk for images and places them in albums based on their folder names. Navigating through albums and images using the explorer is uncomplicated, while an eight-step wizard simplifies photo editing.

After creating a new album, you can drag and drop photos into it and then add captions and descriptions.

SmartDraw Photo includes 11 individually adjustable effects that other basic applications don't. Blur, texturize and vignette (which acts like a cookie cutter, allowing photos to be cropped into shapes) give the user a high degree of control.



And scratch removal and exposure control are handy features bound to be used frequently.

SmartDraw Photo 2.0 is a well-presented package that's a pleasure to use. It contains the core photo editing tools as well as extras such as a screensaver generator and the ability to send email images. All this adds up to a well-rounded image management application.

Details	
Contact	Infotronics
Phone	(03) 9798 4071
Online	www.infotronics.com.au
Price	$122.10
✔	Editing wizard.
✖	Lacks polish.
Verdict	●●●●○

Radar Software Virtual Album

Our first impression of Virtual Album wasn't very positive. It seemed difficult to use and appeared to lack many features. However, on closer inspection of the basic functionality and straightforward controls, our views changed — Virtual Album is a solid utility.

Only basic photo editing functions are on offer here. Cropping, rotation, resizing, auto levelling, brightness and sharpness adjustments can be found, but little more. Photos can be catalogued using custom tags, with searches run on the tags.

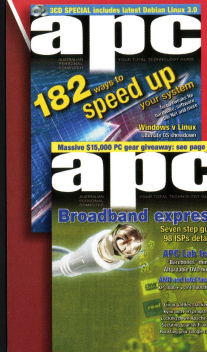
One of Virtual Album's best features is its ability to export albums into HTML format so they can be shared over the Web. It even generates thumbnail menu pages, each thumbnail linking to the larger image. Descriptions can be attached to photos.

Images can be optimised for the Web to reduce size, but it also decreases quality. While packages such as Photoshop feature advanced Web optimisation, Virtual Album sacrifices image quality in favour of reduced file sizes.

Virtual Album isn't going to win awards for design or layout, but it scores for being simple and functional. If you have only basic requirements and want to share images on the Web, it's worth trying.



Details	
Contact	Radar Software
Online	www.radar-software.com
Price	US$29.95
✔	Good price.
✖	Too few editing tools.
Verdict	●●●○○

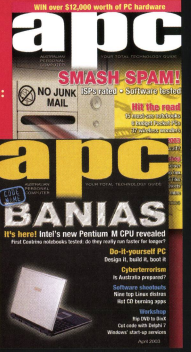


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“***The spikes and surges coming in through the power socket were actually causing screen freezes, lock-ups, and other annoying problems.***”
- Lee Johnson, Home PC User

Do you experience similar PC problems? Keyboard lock-ups and frozen monitors are usually caused by bad power, which can threaten your PC up to four times a day.[1] In addition, surges, sags and blackouts are nine times more likely to strike your PC than a virus[2] and are not just generated from lightning strikes. Something as simple as switching on a heavy appliance inside your home can jeopardise both your hardware and data. In fact, power disturbances are the largest single cause of data loss, accounting for 45.3% of problems.[3]

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- Multiple battery and surge outlets and surge only outlets provide protection for all your equipment.
- **2** 2-year warranty includes battery, spare parts and labour for added peace of mind.
- APC has won more awards for reliability and innovation than all other UPS vendors combined.

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Emergency!

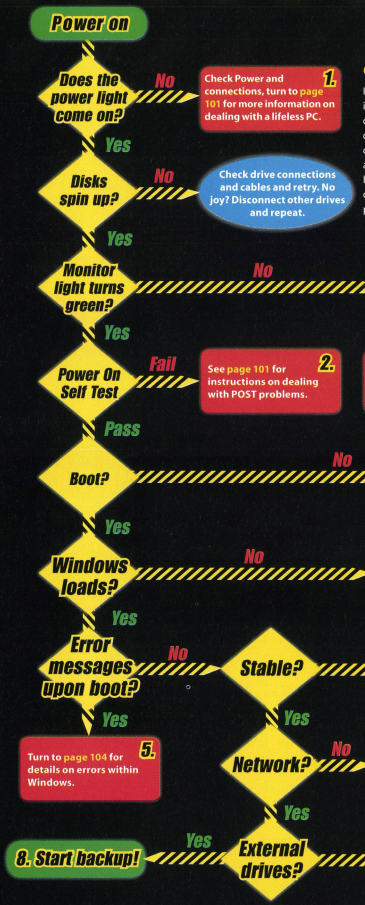
What to do when good PCs go bad

You know that one day you'll switch on your PC and something totally unexpected will happen. It's inevitable. How to stay in control? Find the problem and fix it *fast*. Navigate through our quick troubleshooting chart (right), then check out the appropriate page.

Accompanying CD software



This month's cover CD set is your emergency rescue companion. There's a bootable CD with the essential system utilities from FreeDOS; a collection of backup and file recovery tools; plus a full version of Drive Image 5.0, so you can reload a snapshot of your hard drive to quickly get things back to their working state. We've also included a selection of those must-load programs for Windows, Linux and the Macintosh, so you can do a clean re-install without spending hours (and dollars) downloading.

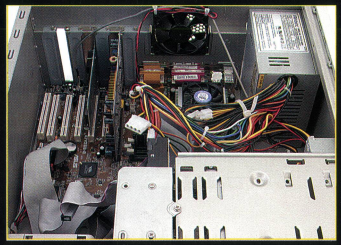


Steps to success

If your computer's suffering an undiagnosed ailment, the first thing to do is to develop a picture of the problem. Note details such as how the error occurs; for example, does it happen every time you boot? Is it dependant on what applications you've loaded, or available system resources? Is only one application affected? After you've got a complete list of symptoms and the times they occur, draw up a basic troubleshooting flowchart to help you run through and diagnose your system errors. This helps rule out out possibilities and narrow down the potential causes of error until the problem is isolated. Follow *APC*'s flowchart to work through our feature.

Basics of troubleshooting

The key to troubleshooting is efficiency: the quicker you can find and fix problems, the faster you can get back to work (or play), explains *Matt Overington*.



▶ **Go topless:** *In the event that your PC fails to boot, start by unscrewing the case fasteners and checking for obvious signs of internal damage.*

For most of us, computers are much more than toys to keep the brain amused. Those plastic, silicon, aluminum and copper lumps on our desks are invaluable tools for working on, communicating with, keeping track of records, calculating tax . . . and, yes, even recreation.

So it goes to follow that if a PC is awesome when it's working, it's incredibly frustrating when it goes belly-up.

And it *will* go belly-up. That's a cruel reality which we've all learned to live with. Even if you're not willing to accept it as the way things should be, it's something you come to expect because, well, it's just the way things are.

Which means that ominous system beeps, a "blue screen of death" or even no image on the screen at all, are things you've got to deal with. One of the most daunting aspects of learning your way around a computer is knowing how to react to these situations. Experience will often suggest a cause of error.

And then there's the unexpected: no matter how many errors you can defeat, there's always a new one lurking around the corner.

The only way to conquer these is to apply the same methodical approach as with every other system SNAFU. It's a simple process of elimination, a dash of digital detective work. So welcome to Troubleshooting 101.

YOUR MENTAL FLOW CHART

Modern computing has an ever-growing list of things that can go wrong. With clock speeds ramping up and software becoming more complex, there are literally thousands of errors that could derail your session in front of the screen.

It would take a decade of *APC* issues to cover each and every possible Windows error, but diagnosis and repair methods don't tend to vary.

With that in mind, it's less important to know how to fix, say, obscure error number 4137 than to have a solid troubleshooting procedure down pat. Being able to run through a mental flow chart will help you work around almost any hitch your computer might encounter, while also arming you with the weapons for taking on the machines of friends and relatives.

1. Playing dead

You've just sat down at the PC to get some work done, pressed the magic button on the front panel, and nothing happens. There's no LED letting you know that the machine is in the throes of booting, and you can't hear any fan noise.

Before panicking, there are a few simple checks to go through. Verify that juice is getting through to the system's power supply unit (PSU) and it's set to the correct voltage.

Sniff the air behind the PC. Power supplies quite commonly go south, and when they do, they give off the telltale aroma of burnt capacitors and circuit boards.

If a smell is coming from the PSU vent, you've probably overloaded it and it couldn't take the strain. A new PSU, costing about $50 for an entry-level computer, can be replaced in moments by simply unscrewing and unplugging. Make sure the PSU you put in its place has an output (measured in watts) equal to the previous one.

Most basic PCs can get away with a 300W unit, but if you're running multiple hard disks and a current-generation processor, you're better off going for 400W or higher.

After replacement, turn the PC on and it should boot without error. There's no need to inform your OS that you've changed PSUs, as product activation has yet to become that Nazi-like. (Of course, there's always Windows 2005 . . .).

Should your PC's fan refuse to spin, chances are it's the power supply again. But there's a small likelyhood it's the motherboard. If the power seems okay, you have to start going through a list of possible faults, working back to isolate the root cause.

OPEN-HEART SURGERY

Start by opening the PC's case. If you've recently replaced your power supply, examine the motherboard, paying special attention to the cluster of tall, silo-shaped capacitors arrayed around the motherboard's CPU socket. These are generally responsible for regulating the voltage and current to your slots and CPU socket.

If you've blown the PSU and sent a power spike down the line, the capacitors will bulge at the top, indicating a fatal surge. The only recourse is to pray that the spike hasn't made it beyond the motherboard to your hard disks and expansion cards. The components inside the machine will have to be pulled out and tested individually.

While it's very unusual for a spike to affect a CD-ROM or DVD drive, it's still possible. We've come across machines

where a brief surge blew everything from mouse to video card.

If the PSU powers up (with CPU and GPU fans) but nothing else happens, there could be a problem with the motherboard, CPU or RAM. If the PSU is fine but nothing happens when you boot — no light on the monitor and no warning beeps — it's generally the motherboard that isn't functioning correctly. Just be sure to eliminate other possibilities before you throw it out.

SHUFFLING CHIPS AND CARDS

A faulty memory module will often halt a computer during the boot, so pull out the RAM chips one by one and try to boot with different memory configurations.

If that doesn't work, pull out all your expansion cards (save the video card) and turn the power on. If the machine boots, start replacing the cards one by one to isolate the faulty device.

Sometimes the peripheral component interconnect (PCI) cards can work loose from their motherboard connection, and pulling them out and replacing them is enough to enable the PC to boot.

WORKING LOOSE

If there's nothing obviously wrong with the RAM or expansion cards, take a look at the connections inside the PC. Disconnect the drives and check the IDE cables for any obvious signs of damage or wear. Reconnect each one, trying to boot at each stage.

If these tricks don't work, take a close look at the motherboard and CPU. Pull them out and test them individually (if you have access to alternate, compatible hardware). If not, ask your local computer shop to run motherboard and CPU tests. It shouldn't cost more than a few dollars.

2. No signal to video card

When you turn the power on and your drives spin but your monitor remains in standby mode, there are only a few things that can be wrong. A cable has probably become dislodged at some stage, so check connections between video card and monitor.

If possible, try the monitor on another machine or replace it with one you are sure is operational.

No help? Then listen closely during the boot. Are there error beeps when the machine powers up? If so, check your video card. Pull it out of the AGP slot, reseat it and try again. If possible, replace it with another card that you know works.

If the machine is silent when you first boot it (excluding fan noise), it's almost certainly your motherboard is causing the problems. Refer to our "Playing dead" section for troubleshooting a motherboard.

3. The check's in the POST

If the PC is powering up enough to emit a series of beeps, you've made it to the Power On Self Test (POST). And at least the motherboard is functioning correctly, or at least okay enough to try to let you know what's wrong.

When a machine is turned on, the first job of the basic input/output system (BIOS) is to perform the POST, a diagnostic program that checks the hardware. Technically speaking, this occurs before the boot procedure.

The PC speaker is used to warn of the error because the POST executes before video is initialised. Look in your motherboard manual for how to interpret the series of warning tones, which vary from one manufacturer to another.

For a generic rundown of POST tones for common BIOSes, go to **www.pcguide.com/ts/x/sys/beep/index.htm**.

The POST tests many individual components including DRAM refresh, system timer, processor, keyboard controller, cache memory and video memory. In the case of boards fitted with the AMIBIOS, continuous beeping indicates a problem with either the system memory or video controller.

After checking the tone pattern with your motherboard manual and finding the cause of the fault, fixing it can often be just replacing a faulty RAM module or inserting a new video card. Or, the POST can alert you to a deeper fault that could otherwise take several days to troubleshoot.

Online Help

The Internet is bursting at the seams with information on what to do in the event of a crash. Whatever obscure error your machine is throwing at you, it's a given that someone else has experienced it too. You can find information on virtually any error via a Google search, but there are a few sites we rely on for troubleshooting information.

www.windowsgalore.com
Stacks of great information for older versions of Windows, namely Windows 95 and Windows 98.

www.labmice.net/troubleshooting/default.htm
Outstanding source of info on Windows 2000, including articles on troubleshooting, repair, and maintenance.

www.windows-help.net
A rich site full of miscellaneous tips for Windows 9x, Me, 2000 and XP. Look to the bottom of the left-hand pane for tips.

www.winnetmag.com/Articles/Index.cfm?ArticleID=4754
This older article on finding and fixing memory leaks for Windows NT is still relevant today.

www.kellys-korner-xp.com/xp.htm
A gaggle of Windows XP links. They cover all facets of dealing with XP from installation to power tweaks.

www.wintrouble.net
Bud's Windows Troubleshooter. The title says it all, but this site is includes a little of everything, including DOS tips.

www.pcguide.com/ts/
The PC Guide troubleshooting hub is full of base-level information including how to deal with the Power On Self Test.

www.theeldergeek.com
A healthy quantity of news and information on Windows XP with a lean towards troubleshooting.

www.microsoft.com/technet/treeview/default.asp
How to troubleshoot common problems with versions of Windows straight from the horse's mouth.

support.microsoft.com/servicedesks/fileversion/dllinfo.asp
Microsoft's DLL Database — extremely useful if you're getting an obscure DLL-related error and need more information.

4: Putting the boot back in

Your PC can cough up myriad errors *before* being able to load Windows or any other OS. Here's a rundown of the most common problems that might prevent you from booting Windows, and how to fix them.

SAFETY FIRST

First, attempt booting Windows in Safe Mode, which loads a minimal set of drivers. Autoexec.bat and config.sys are not accessed and most of the Windows registry is ignored.

Press F8 during the initial boot process to load the boot menu. Select Safe Mode from the options list and press Enter.

You can also opt for step-by-step confirmation to isolate an individual line that may be at fault in the autoexec.bat or config.sys files.

If there's a problem with a setting in the registry or device drivers, choose the Safe Mode option that loads the Windows graphical user interface. From here you can make the necessary changes to remove the source of the boot failure.

Skip to page 104 for how to repair these errors from within Windows.

MISSING IN ACTION

One of the most common error messages in Windows 2000 and XP machines is "NTLDR is missing. Press any key to restart". It signals a fault in one of three files: ntldr, ntdetect.com, or boot.ini.

This fault is sometimes caused by an out-of-date BIOS, which can be corrected by applying a flash update. Check your motherboard manual or manufacturer's Web site for how to flash your BIOS — but be careful. If the job is done incorrectly, it can corrupt the BIOS and render your machine unbootable.

One way to get around the NTLDR error message (after checking your BIOS version) is to use a boot disk containing the appropriate files and replace them as necessary. The disk can be made as a precaution while your PC is still healthy, or belatedly on another machine.

For details of how to make a boot disk under Windows to suit FAT and NTFS partitions, see the support article on the Microsoft Web site (**http://support.microsoft.com/default.aspx?scid=kb;EN-US;301680**).

The preferred method in *APC* Labs is to rely on the original install CD for Windows 2000 or XP to do the hard work. Boot your PC with this CD in the drive and hit R to enter the Repair Options page.

Press R again, and when the prompt appears for selecting a repair option, press M. Now hit the up arrow a couple of times to select Verify Windows system files, and Enter to proceed.

After you have made the selection, move down to Continue and press Enter. You'll be prompted to insert an Emergency Repair disk. If you don't have one, press L to receive a message telling you where Windows is located on you hard disk.

All you have to do is press Enter and Windows will automatically make the repairs. On completion, you should be able to reboot the machine to Windows as normal.

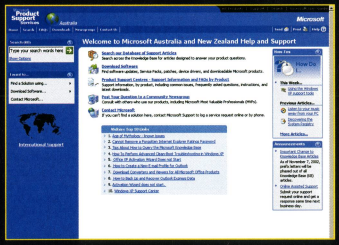
GRUB OR LI

If you have been trying Linux on your computer and have opted to switch back to Windows, you may find a Grub or Li message when you boot, followed by . . . nothing. This is because the Linux boot loader has been left on the disk after Linux has been uninstalled.

The solution is to reinstate the master boot record (MBR). Skip to the next page, on driving the Recovery Console, for details.

XP'S FATAL STOP ERROR

When installing a new piece of hardware under Windows XP, there is always a chance that the OS won't boot. You will receive a fatal stop error and one of those ominous blue screens just before launching the graphical environment.



▶ ***Source code:*** *The Microsoft support site is an invaluable resource during times of trouble.*

This is actually part of Windows XP's hardware tracking. When calling Microsoft and activating Windows XP, a list of the hardware in your machine is drawn up. This is cross-referenced at boot-up with the saved configuration. If a number of changes are detected, a fatal error is indicated.

It isn't a given that you'll have to reactivate Windows. It depends on how much has changed. Upgrading your CD-ROM drive is unlikely to cause a boot to fail, but changing the motherboard is almost guaranteed to do it. This is because the motherboard's individual components maintain separate entries in the Device Manager.

We're as much against Product Activation as anyone, but there's little that can be done to avoid it without breaking the law.

MBR MISINFORMATION

Being confronted with the messages "Missing operating system" or "Non-system disk error" was relatively common under DOS and Windows 95, but they are rarely found in newer versions of the OS.

They mainly display if the MBR doesn't contain the correct boot information or if there is no active partition on the drive. The boot sector is therefore invalid and needs rewriting.

Once again, refer to "fixmbr and fixboot" on the facing page for instructions on how to rewrite a boot sector.

The partition's active flag can also be set using the Windows Recovery Console's diskpart command.

Minimal console-ation

When the going gets tough, the tough go to the command line.

Experienced Unix and Linux users will be saying "Told you so", but if you really need to get right into the settings to make serious changes to an uncooperative system, the command line can't be beaten.

For hardcore troubleshooters, the Windows Recovery Console is one of the most useful inclusions in Windows 2000 and XP. It grants limited access to FAT, FAT32 and NTFS volumes without booting to a full-blown Windows environment. It's often used to perform disk maintenance or make basic changes to system files, as the user is equipped with a powerful yet minimal set of tools.

Remember, you'll need Administrator access on the broken machine before you can use the console. This is designed to protect the data caught on NTFS partitions. It's possible to make devastating system-wide changes through the misuse of the Recovery Console, so be wary.

Should you be unsure if the OS uses a file, err on the side of caution. Don't fiddle.

PASS THE PASSWORD

Boot with the Windows 2000 or XP startup CD and press R to repair an installation, followed by C to launch the Recovery Console. You'll be prompted to choose the appropriate number for your Windows installation (only one will be listed unless you are dual-booting the machine) and to enter your Administrator password.

If, like many other home users, you haven't established an Administrator password, hit Enter to continue.

Entering the right details will be met with the line "Windows NT Boot Console Command Interpreter". Think of the Console Command Interpreter as a limited version of MSDOS. From here you have access to the root folder, the %SystemRoot% folder, the subfolders of whichever installation of Windows you selected earlier, and removable media drives.

Note: you can't copy files from a hard disk to A removable drive, or access other folders on the drive. Typing HELP at the prompt will display a list of the commands you can use at the console. Many of the commands will appear familiar to old DOS hands (cd, dir, delete, copy, rename), but others (fixmbr, diskpart) are more obscure.

You can use the standard DOS commands to move, rename, copy and delete files; exit will cause you to leave the console and will reboot the machine. But the console's true power lies in its less-used commands.

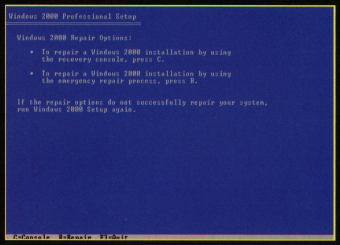
A couple of basic disk tools are included. Map, which is the first, prints a list of all the disks and partitions in the machine, in a \Device\Drive\Partition format. Typing diskpart at the prompt enables you to create and delete the individual partitions on a drive. Note that you'll need a tool like Partition Magic if you want to resize partitions, as by default most partition manipulations will destroy the data stored there.

Once in a while — for instance in the case of installing a second OS — you will have to make changes to a drive's master boot record (MBR). This change usually points to a program such as Lilo or Grub to provide a boot menu, but sometimes uninstalling the second OS will trash the program but leave the entry in the MBR. That way, when the machine first looks at the MBR, it's redirected to a program that no longer exists, causing the computer to lock up.

The MBR is also susceptible to corruption by a virus attack.

FIXMBR AND FIXBOOT

The two least-used, but nonetheless invaluable, console commands for disks are arguably fixmbr and fixboot. fixboot <driveletter> can be called to write a new boot sector code to the specified drive, while fixmbr rewrites the MBR on the system partition.



▶ ***Blue Screen of Life:*** *The Windows Recovery Console, included with Windows 2000 and XP, should be your first point of call if you're having trouble launching the OS.*

Note that fixmbr can cause your partition table to become corrupted if you have a virus on your system. We highly recommend that you check your system for viruses as the first point of attack. If fixmbr detects a problem with the partition table, it will ask your permission before making any changes to the disk.

Users can also format a drive under NTFS, FAT or FAT32, so the recovery console is a good point of call when you first boot with a new drive connected to your PC.

DISABLING SERVICES

The Recovery Console also can turn on and off system services executed at startup. If a particular device or service is causing errors, try disabling it and restarting the computer.

You can use the listsvc command to display all the services or drivers that can be disabled, while the enable and disable commands set the start_type values for each service.

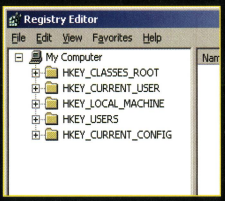
Each service or driver can be set to one of: SERVICE_DISABLED, SERVICE_BOOT_START, SERVICE_SYSTEM_START, SERVICE_AUTO_START or SERVICE_DEMAND_START.

Typing disable <service-name> will turn a service off. Entering enable <service-name> <start_type> at the console will set the start_type value to whatever you specify.

After you've made all your changes, type exit at the prompt to lock your changes, and reboot your PC.

Windows boot errors

Finding the cause of boot errors within Windows can be a time-consuming and frustrating task. *Matt Overington* simplifies the process.



▶ **Quick Registration:** *The Windows Registry plays host to myriad settings. Just be sure to back it up before making any changes.*

How to deal with them

After you've managed to get your PC booting into Windows, you're halfway home. But Windows itself can cough up all manner of errors during the boot process as it's initialising drivers and accessing the registry. When you're troubleshooting an application, pay close attention to error messages. Note down what you did to generate the fault. Is it happening during gaming or while performing hefty database calculations? Does it occur when you launch a particular application or combination thereof? Only with this information can you start to draw up a list of probable faults.

DEVICE NOT RESPONDING?

If you get a Device Not Responding error when you load Windows, the first thing to do is make sure you have the right driver installed.

Open the Control Panel and click on the System icon. Select the Hardware tab and click on the Device Manager button to launch the manager. Any devices with errors will display either an exclamation or question mark beside their entry. Double-click any malfunctioning device to open the properties window. In the General tab, you will be able to read a description of what's wrong with the device. Usually the problem will be caused be either a missing driver or a hardware conflict. In the case of the former, select the Driver tab and click on the Driver Details button to gather information on the file and version of the driver in use.

Check the manufacturer's Web site for the appropriate driver with a higher version number than the one you're running and install it using the Update Driver button under the Driver tab.

Hardware conflicts used to be much more common in the days of DOS and early versions of Windows, but they still occur. A hardware conflict is usually generated because two physical pieces of hardware are trying to share a system resource. In this case one device will sometimes work, but usually both items sharing the resource will register errors. Go through the Device Manager looking for components that share an IRQ (located under the Resources tab of an individual device listing). If you manage to find a conflict, change one of the devices to point to a new IRQ and reboot the machine. If you haven't fixed the problem, pick a new IRQ and retry. A little patience is key.

If you try these methods and can't get a device to initialise correctly, there's a chance that something is wrong with the hardware. Pull the hardware device out entirely and try rebooting the machine. If Windows loads cleanly and without errors, try replacing the device and reinstalling a driver. If that still doesn't work, pull the device out and try it in another machine, as there's a good chance it's faulty. The only way to make sure is to try it in a few different environments and take note of any configuration issues at the time.

EXTERNAL DEVICES

Troubleshooting an external device is a two-part process. You have to check the individual driver for the external hardware and the chipset driver to ensure that Windows can actually communicate efficiently with it.

The OS support for high-speed transport protocols like USB 2.0 and FireWire has only recently been added, so you'll need to make sure you are running the latest patches and service packs for your version of Windows. Windows XP introduced USB 2.0 support in Service Pack 1, while Windows NT requires Service Pack 3 to provide high-speed USB functionality. FireWire support was rolled into the boxed versions of Windows XP and 2000, but later service packs must be installed before it is stable and reliable.

THE REGISTRY

If you're getting all manner of startup errors pertaining to half-installed software packages or missing DLL files, the key to fixing the problem lies in the registry. The registry is a database that stores your Windows settings and options for installed software. Every Windows system setting for your PC resides in the registry, from applications installed to screensaver and desktop wallpaper settings.

Windows 9x-based machines have two registry files, named USER.DAT and SYSTEM.DAT, which are stored in the Windows folder. Windows 2000, XP and 2003 maintain separate registry files for each user.

The Windows registry becomes clogged over time, as all the programs you install add their own little entries to it. Theoretically, when you uninstall a program its registry entries are erased, but this often doesn't happen. Over the course of several years of installing and removing applications, the registry winds up full of redundant entries, which in turn impact on performance, or in a worst-case scenario, produce errors.

One way to go ahead and fix any unwanted entries is to use a dedicated registry-cleaning application like RegCleaner (found at **www.vtoy.fi/jv16/shtml/regcleaner.shtml**), but it can also be done manually. Bear in mind that playing with the registry and deleting keys can be potentially harmful to your machine, so be sure to backup the USER.DAT and SYSTEM.DAT files before you begin.

Backing up the registry under Windows 9x is a straightforward task. Click on the Run icon under the Start menu and type command into the box. At the DOS prompt, type `copy c:\windows\user.dat c:\windows\user.xxx` and press Enter. Follow that with `copy c:\windows\system.dat c:\windows\system.xxx`. If the registry ever becomes corrupted, you can boot to a DOS prompt by pressing F8 during the boot sequence, and then copy the `user.xxx` and `system.xxx` files back to user.dat and system.dat respectively.

Under Windows XP, you can use the system state backup tool. This is a function of XP's own Backup applet (usually found in the Start Menu's Accessories/System Tools group). An advanced backup wizard can be run to save your system state to a hard drive or removable disk. This can be reinstated if the registry becomes corrupted further down the track.

Open the registry editor by clicking on the run button under the start menu and typing Regedit into the box. This will work on any version of Windows from 95 right up to XP and Windows Server 2003.

The registry is divided into hives populated with keys. Each key can then hold either sub-keys or values. When you launch Regedit, you'll notice six hives listed in the left pane. Look to the Registry Hives sidebar to learn what each hive stores.

6. Stability issues

If your PC is crashing when you launch a certain application, there's a good chance the installation has become corrupted. Try removing the application and reinstalling it. If this still doesn't fix it, take a look in the registry for any signs of redundant or faulty entries. See the previous section on working with your registry for more information on how to clean up any troublesome entries.

If your machine is crashing randomly, you'll have to do a little more work. A possible cause is a faulty RAM chip. Try pulling out RAM modules one at a time, booting the machine between each change, and keeping an eye on the PC's performance. If this makes no difference, an overheating CPU could be causing the error.

The most obvious sign that your CPU is cooking itself is a tendency for the PC to reboot at seemingly random moments. Generally it happens when a PC is under load because it warms up as more tasks are placed on the CPU. The PC reboots automatically when the CPU reaches a certain temperature to prevent damage to both the processor and motherboard.

One of the trickiest things about troubleshooting a heating issue is that by the time the PC reboots, the processor has often cooled enough to enable it to start up normally. The machine will be perfectly stable until the CPU is strained again.

Thankfully it's generally not difficult to fix. Your processor heatsink has to be attached tightly to the top of the CPU — especially in the case of an AMD processor, where the core is exposed on the top of the chip.

Take the CPU fan off and check that the mounting clips aren't bent and that the bottom of the heatsink is coated with a thin layer of thermal grease. *APC* recommends Arctic Silver, available from most computer shops. Make sure the fan hasn't seized and the heatsink baffles aren't clogged with dust and grit. You can even pull the fan off the top of the heatsink and clean the copper or aluminium block with running water. Make sure it's dry before you put the fan back together again.

Another common complaint about fans is the din they make. A drop of 5wt sewing machine oil in the top will often lubricate the bearings enough to silence it. Failing that, pick up inexpensive replacement fan from an electronics shop.

The best way to combat instability issues and small OS quirks is to make sure you're running the most recent patches and updates. Use any automatic update features included with your version of Windows. They'll keep you on top of new security patches and updates, and it's handled transparently, without user intervention. Patches can be set to download overnight, minimising the impact on your Internet connection.

DRIVE ERRORS

If you're getting a lot of read and write errors or corrupted files from your hard disk, it's almost a given that your drive is riddled with errors and the end of your disk is nigh. Running applications such as ScanDisk or Norton SystemWorks on a weekly basis will help you detect and diagnose disk faults, but it's imperative you regularly back up your data.

That said, it's rare that any computer system is 100% backed up in the event of a disk failure, but that doesn't necessarily mean your data is gone forever. If you have some cash, turn page 106 to learn about possible recourses and methods to recover information after a total disk crash.

Treatment for Microsoft registry hives

The Windows registry is divided into a series of main branches, or "hives" in Microsoft-speak. Here's a guide to the settings stored in each hive.

Be aware that making changes to the registry can severely affect your system. Back up the registry before editing. Also, as Windows 2000, XP and Server 2003 keep per-user registration files, you will have to log in as an administrator to make system-level changes.

HKEY_LOCAL_MACHINE
This is the first group listed in the registry. It stores all the details of your machine, from hardware settings to information on memory, drivers and startup files.

HKEY_CLASSES_ROOT
The root class hive stores file types and their associated applications. Object Linking and Embedding (OLE) information is stored here, and is generally used by applications.

HKEY_CURRENT_USER
This registry entry contains all the data on the user currently logged on locally. It includes all their desktop settings, environment variables and preferences. Information on network settings and printers are also found here.

HKEY_USERS
The users hive stores details on the user profiles resident in memory, along with information on the default profile. This information is repeated in HKEY_CURRENT_USER.

HKEY_CURRENT_CONFIG
The fifth category stores information on the hardware profile and is actually part of the HKEY_LOCAL_MACHINE hive. This information is accessed when the PC is first booted, and is used to load device drivers and default settings.

HKEY_DYN_DATA
This group is not found in Windows Server 2003, but it contains information on data that must remain loaded in RAM.

Doing the hard yards

Tried everything and still can't get your hard disk to boot? There are ways and means to recover mission-critical data when your PC goes pear-shaped, but it'll cost you. *Drew Turney* explains.



▶ ***Crash here:*** *a head crash occurs when the read unit physically slams into the rotating platter.*

You can be forgiven for thinking that computers are tough. We shove them under desks, accidentally kick them, and pile peripherals all over them. They say you can tell someone who's never opened a computer before by how careful they are. Technicians tend to display the tenderness of a lumberjack.

Don't be fooled. A hard drive can go bad for many reasons, and it's usually cause for panic. You have potentially lost the only thing on your computer that can't be replaced — your data.

It doesn't take a lightning strike or a house fire. The tiniest knock at just the wrong angle can cause a major failure, ranging from a BIOS breakdown to boot file corruption to a head crash.

Of course, you should already be preparing for the worst and pre-empting hard drive failure. You should be heeding the mantra and performing regular backups.

But a hard drive failure doesn't mean all is lost. As we enjoy telling the computer-illiterate, deleting data doesn't mean it has gone. Short of physical destruction of the disk, in data recovery you can, at least theoretically, retrieve data regardless of the fault (or error).

But there is a catch: the cost. The nearest computer shop might tell you the situation is hopeless, but it's said that with the right expertise and enough money, data can be recovered from a disk that's been reduced by fire to a metallic blob.

There's also a race going on, without a finish line in or out of sight. As computer data becomes more instrumental to the workings of society, security demands increase, and so do efforts to produce the tools needed to circumvent them.

OTHER HARDWARE

If the hard disk itself is undamaged, the problem could lie with hardware other than the platters and head assembly. Your basic input/output system (BIOS) may not recognise a new component, it might break down through wear and tear, or there could be damaged connections inside the drive housing. Or the problem might be software-based, such as a virus corrupting the startup files.

Should you get an error message (or nothing at all) during bootup, an average commercial operating system can be booted from the CD, and you may have created your own emergency boot disk. You can at least run drive-level diagnostic software such as Norton SystemWorks (available for Windows and the Mac) or even Windows' own ScanDisk to isolate and fix the fault.

If you have the means, a manual and workable solution is to install your OS on a server or second computer, boot up from there and access the damaged drive in the same way your desktop OS accesses removable media. You can literally drag and drop the files you need to recover off the damaged hard disk, reinstall a clean OS onto it and then change it back to your boot drive.

If the problem seems to affect certain

Who you gonna call?

Professional data recovery services are few and far between, and they're not cheap. It pays to phone around to get several quotes before committing.

Company	City	Phone	Web	Systems
Forensic Data	Sydney	(02) 9368 1699	www.forensicdata.com.au	All
Forensic Data	Melbourne	(03) 9867 7773	www.forensicdata.com.au	All
Portacom	Perth	(08) 9481 1565	www.portacom.com.au	PC
Desktop Applications	Perth	(08) 9322 6789	www.desktopapplications.com.au	Mac
Precise	Melbourne	(03) 9831 6100	www.pdrs.com.au	All
Precise	Brisbane	(07) 3368 1644	www.pdrs.com.au	All
Data Recovery Services	Sydney	(02) 9810 2000	www.datarecovery.com.au	All
Encom Technology	Sydney	(02) 9957 4117	www.encom.com.au/pages/tsme.htm	Tape
Encom Technology	Perth	(08) 9321 1788	www.encom.com.au/pages/tsme.htm	Tape
Payam	Sydney	(02) 9876 2425	www.payam.com.au/services-datarecovery.html	PC
Data Recovery Labs	Sydney/Brisbane	1800 855 050	www.datarecoverylabs.com.au	All

functions or files and you feel you may have a virus, a virus checker with updated definitions should do, with directions to a patch or update.

If you're confident of isolating a problem and correcting it, you can't do too much harm as long as your data is backed up. The worst that can happen is having to reformat the disk and reinstall everything.

If you're unsure, get advice from a technician. Any expert should be familiar with your problem if you can give a clear description. Walking you through the solution might not take much time at all.

SICK AS A DISK

If your hard disk itself is damaged, the problem is more forbidding and the cause can be as individual as your desktop picture.

The first thing any professional technician will do is get it spinning. The physical structure of the drive can be damaged while the data on it can be almost completely intact. It might be warped, partly melted or otherwise out of shape. Machines exist, or can be engineered, to get a disk spinning at the right rate for a read/write head in almost any state of damage you can think of.

Once it's made to spin as if it's inside a PC, special or even everyday heads can be employed to read the data. Obviously, the disk will be unusable in the future, but at least you'll get your data back.

The rest is probably something for an insurance company to worry about.

The situation is more serious if the data is unreadable because of a structural problem, such as a scratch inflicting bad sectors. But it's still not impossible to get around. One data recovery service in Sydney uses a technique that reads a bad sector up to 1,000 times. Out of three or four half-decent reads that pick up sufficient bits, the sector can be recreated with astonishing accuracy somewhere else for reinsertion into the readable data.

PERILS OF OVERWRITING

Just as there are two basic kinds of data problems, there are two kinds of fixes, and the distinction is important.

If you use your boot disk to perform any function, you're modifying data — writing new data to the disk. A hard disk isn't a filing cabinet with neatly categorised documents. A single file can be spread over several platters, and the job of the read/write heads is to access and reconstruct it.

So the very act of writing data to the disk will be overwriting other data, and that can be information you're trying to recover. Keep that in mind when you use a software-based method directly from your boot drive.



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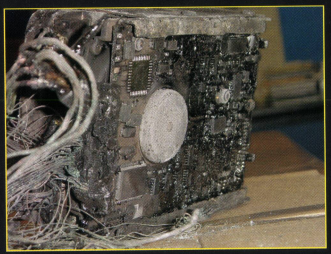
Many, from free OS utilities to dedicated software such as Norton SystemWorks, do a good job, but they can also bury your lost data even deeper.

MIRROR IMAGE

A safer method is to recreate the disk. Some data recovery services sound impressive, using big words and technical jargon, but they might simply be running off-the-shelf software tools over your disk. Sure, they might sound better than the ones you have access to, but if they are making your data even more inaccessible, they're no better than a dodgy freeware download.

It's safer to take a disk image. Special equipment can be used to completely reconstruct the contents of a damaged disk one bit at a time (using the multiple-read method to get the full picture, if necessary). This literally builds a mirror image of data on a new disk using every individual one and zero.

This allows you to make a few copies of your data and to try different methods on each copy. Even if you do use software scans that further write over one of your copies and the recovery doesn't work, you can start from scratch on another copy and your original drive will remain unaffected.



▶ ***Data to burn:*** *with the right expertise and money, data can be recovered from a disk reduced by fire to a metallic blob.*

Buyer beware . . .

- **Some data recovery services offer free initial inspection. It sounds great, but you'll probably end up paying for those "free" hours somewhere along the line.**
- **An upfront inspection charge should entitle you to a detailed report of what can be done and what it will cost. It also gives you the option of paying only for what you want retrieved and not the entire contents of a disk.**
- **There is no standard rate. Charges will depend on the extent of the problem and the methods needed, and good methods aren't cheap. Work out how much your data is worth to you — even if it's not commercial, it might be priceless.**
- **Professionals shouldn't object to you calling for advice. It gives them the background knowledge they'll need if you decide to use them, and you can gauge if they know what they're talking about (or if they will have to subcontract the job to someone else).**
- **Even the best software is useless in inexperienced hands. Don't assume you're paying someone to just click a few buttons, and don't be afraid to ask for details of what they do.**
- **Each case is different, but some software promises generic results. One package even promises to retrieve your data over the Internet. But be wary of one-size-fits-all solutions.**

REMOVABLE MEDIA

Before doing anything with removable media, ensure the problem is disk-based. Removable drives suffer read failures for all sorts of reasons and can make your system think that the disks are the problem.

There is, thankfully, little difference between trying to pull data from a floppy riddled with bad sectors, and off a hard disk with the same problem. With the exception of CDs and DVDs, most removable storage media for PCs works the same way as your hard disk. A hard disk is just a more protective setup because it contains the files that drive the computer.

Be it a floppy or Zip disk, or even a dinosaur such as a Jaz or SyQuest cartridge, all magnetic computer disks have a housing containing a round piece of plastic, glass or metal. A mechanism inside the driver spins it, and a read/write head (or a laser in the case of CDs) scans the surface, reading the blips that signal binary code.

A strong word of warning: no method with removable media is 100% safe, and different recovery software works in different ways. Some of it scans without interfering with the data on the target disk; some of it writes small index files or markers. Overwriting or further damaging file headers you hope to get back is the last thing you want. Make sure you know how your software works by getting advice before you start from a professional.

With removables, you might have to update your BIOS or drivers, or replace the whole drive. They're not as robust as hard disks and tend to get a lot more environmental exposure.

Recovering data from a removable disk is easier (in theory) because you're not writing to the disk you're trying to retrieve from. Whereas self-help fixes on hard disks involve booting from another drive, your standalone PC already treats removable disks that way, so you can be reasonably sure no new data is being written to the disk you're trying to retrieve from.

That's important because the best recovery software in the world won't do any good if installing it overwrites files you're trying to get back.

WORKING ON COPIES

If the removable disk is definitely at fault, the first step in a 100% safe recovery is to write a disk image or copy. Virtually every Windows and Mac OS over the last five years includes a disk imaging utility (called Disk Copy in both current platforms), so try as many recovery methods on as many copies as you like, right on your desktop.

You might get lucky, but in theory, you'll

be making copies of the same bad sectors. If commercial restore utilities, such as Norton SystemWorks, don't help, it's time to consider a data recovery service.

THE PROFESSIONALS

There are plenty of data recovery services to choose from, and your choice will depend heavily on demand and budget.

Skilled data-recovery houses can pull data back from the brink, and are often called upon to provide evidence in court cases. It's said that standard procedure in the American National Security Agency (NSA) is to fire bullets into hard disk platters when they are taken out of commission. In the mind of the NSA, this remains the only foolproof way to *totally* trash a disk beyond recovery.

Closer to home, the Forensic Data company has extensive experience in recovering data from hard disk drives, floppies, Zip disks, Magneto-Optical cartridges, CDs, and tapes. The company, with offices in Sydney and Melbourne, has been in operation since the 80s and its technicians have developed methods to help extract the data from the damaged media.

The cost of recovery ranges from a few hundred dollars to several thousand, based on the amount of time and effort required to pull the information from the faulty store.

That might be more than you need on your home PC, but imagine the value of data stored on the hard drives of a business PC, even that of a small business, where 100 client records might be its lifeblood.



▶ ***Smoking gun:*** *data-recovery houses are so good that the NSA has a policy of firing bullets at hard disk platters when they are taken out of commision.*



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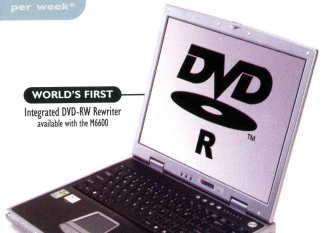
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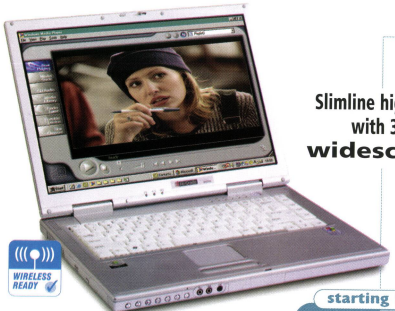
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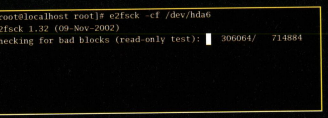
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The Penguin resurfaces

Linux is well designed, but can be as prone to hardware failures and user mishaps as any OS. *Paul Robinson* has the tips to get you back on your feet.



▶ ***File fixing:*** *e2fsck, the Linux equivalent to Microsoft's ScanDisk.*

The stability of Linux can lull users into a false sense of security. They don't bother to have an appropriate backup routine, without considering the possible ramifications. When disaster strikes and they're faced with a boot prompt of "LI . . ." or worse, they have no rescue disk and no alternative but to start from scratch.

With the right tools and a sound recovery plan, it doesn't have to be this way. Included on this month's cover CD set is a rescue disk image file and the program that creates a bootable disk.

There are several measures for avoiding headaches, and a fairly easy process for getting back on track after a file-system failure. But nothing is perfect and some problems may be too severe to fix. However, reinstalling the OS should remain the last resort.

BACKUP MANTRA

As usual, prevention is far better than any cure. You can't stop a drive from going belly-up, but you can minimise the chances of other problems occurring, such as the accidental deletion of files, and minimise their impact on a system.

Backing up important files is the most effective safety measure of all. There's no definitive list of what directories and files should be backed up, but the general rule is to archive anything that can't be restored to its current state relatively quickly.

For example, you wouldn't necessarily back up the /usr directory, as programs can be reinstalled quite easily. You probably would back up the /etc directory because it has all your customised config files and init scripts. It's generally prudent to back up the /etc (or at least /etc/rc.d and /etc/sysconfig), /home and /root directories.

Depending on what's installed on the system, areas such as /var/log, /var/ftp and /var/www should also be included in a backup regime, particularly if you're hosting a multi-user system with ftp and Web services.

Those running databases such as MySQL and PostgreSQL should be aware that tarring the data directories will not provide useful archives. You *must* use a database-dependant backup utility to make snapshots of databases before archiving them. An example is mysqldump for MySQL.

Any standard installation of Linux has a built-in backup tool called tar. You can use this command, with its rather straightforward syntax, to create your own archives.

Here's a typical command to back up the home directory to a tarball in a non-standard root-level directory called /archive:

```
tar -zcvpf /archive/backup-`date '+%d-%B-
%Y'`.tar.gz
  --directory /home --exclude="*.iso \
  --exclude=proc --exclude=tmp \
  --exclude=bufferdir .
```

Tar requires that certain options be provided, and we've used the following:

- `z` compress to GZ file
- `c` create new archive
- `v` verbose
- `p` keep the existing permissions
- `f` the following argument is the filename

The third argument is the archive file created. As there will be multiple tar commands, each for a vital directory, the archive names should mention what directory was archived, such as /archive/backup-home- as a prefix with the current date to stamp the file. You aren't obliged to use the .tar.gz extension — you can use whatever extension you want — but it's common to use the default .tar.gz extension.

The fourth argument is the top-level directory to archive:

```
--directory /home
```

With the next arguments you can specify which files or directories need to be excluded from the archive. This can easily been done with the `--exclude` directive. In the example above, all ISO CD image, `proc` and `tmp` files have been excluded as they weren't vital:

```
--exclude=proc
```

It's often forgotten that a dot (.) should be specified to show that everything else needs to be backed up.

Instead of creating a new archive, you can add files to the end of an existing one. Simply change the `c` (create) flag to `r` (append). Another useful way is updating the archive with only those files that are newer. This is handled by specifying `u` (update).

Create an executable shell script with archive commands similar to the one on the left for each directory you need to back up, and it can be set to run as often as required by copying it to the appropriate /etc/cron directory (/etc/cron.daily would run the script daily).

Of course, storing the archives on the drive you are backing up is self-defeating. If it fails, the archives will go with it. Store them on another machine via Samba or FTP, by burning to a CD, or using some other external medium.

MINIMISING MISTAKES

We've all deleted a file by mistake. While Windows always prompts for confirmation by default, some Linux distros will quite happily obliterate your system the instant you press return on rm -rf /.

Many of the popular, more user-friendly distros will, like Windows, ask for confirmation

before deleting files or directories, as they've aliased the rm command. If your distro doesn't already do this, it can easily be added by modifying the shells .rc file to include the line :

```
alias rm='rm -i'
```

In most cases, the bash shell file is named .bashrc in the user's home directory.

The other risk-reducing habit to get into is reducing the amount of time spent logged in as root. When logged in as a user, the damage you can inflict is contained in a small section of the system (such as the home directory or database files). But as root, you can make mistakes that affect the whole system.

SAVIOUR ON CD

If your system fails to boot, your only hope of resurrection lies in having a suitable rescue disk. This month's cover CD set has an excellent rescue distro enabling users to check, format and mount file systems as necessary, as well as network support for those who need it.

To make a rescue disk, copy RawWrite from the CD set to a local directory and run it. RawWrite has improved dramatically, and the more recent Windows version sports a GUI interface.

Select the ramf-120.img file and insert a blank floppy to copy to. When RawWrite has finished, you can use the disk to boot a faulty Linux system and perform the most necessary maintenance routines to bring it back to life.

ERROR UTILITY

If, for no explainable reason, your system has started throwing kernel panics during the boot process, there could be an error with the partition containing either the /boot directory or the kernel modules. Linux has a disk error checking utility called e2fsck. You may have seen it in action without realising — whenever the system was improperly shut down and the utility performed a check on each mounted partition.

Let's assume it's /dev/hda6 that's giving grief. First, unmount the partition with umount /dev/hda6. If the partition is checked while mounted, you can seriously corrupt the information on the drive. We can then check the partition using the command:

```
e2fsck -pcfv /dev/hda6
```

The extra flags tell the file system checker to:

- p automatically repair without asking questions
- c check for bad blocks
- f force checking even if the file system is marked clean
- v verbose output

Checking completed, the system is rebooted and all errors have hopefully been fixed. As mentioned, some faults are too serious to fix for a 100% success rate.

You'll appreciate the reason for backing up files if you've ever had a partition that required replacing or wiping. The files from the last backup can be restored quite easily using the tar program that created them. For example:

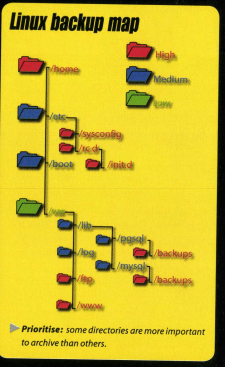
```
tar -zxvpf test-backup.tar.gz --directory
/home/test/
```

This restores the file test.backup.tar.gz in the /home/test/ directory, this time using different arguments:

- z compressed GZ format
- x extract files
- v verbose
- p replace permissions with those in the backup file
- f the following argument is the filename

Be careful because any existing file that's also in the archive will be overwritten. Instead of using the x for extracting, you could use t to check the archive by getting a complete list of the files in it. If you're not sure if a file exists in the backup, this is easily done with:

```
tar -ztvpf test-backup.tar.gz | grep
'checkforthisfile'
```



Prioritise: *some directories are more important to archive than others.*

BOOTLOADER WOES

A common hurdle is when the Linux Loader, either LILO or GRUB, fails to load Linux. This can happen for a variety of reasons. The main one being the installation of a second OS, such as Windows, overwriting the Master Boot Record (MBR). Or there might be an incorrect entry in a config file from the last time the boot loader was updated.

Fixing this is quite simple. Using the rescue disk created earlier, boot the rescue distro and mount the appropriate partition of your Linux system.

Now fix the boot loader's config file if necessary, and run one of these commands, depending on which boot loader is used:

```
sbin/grub-install --root-directory=/boot '(hd0)'
```

or

```
sbin/lilo -v
```

These commands must be run from the directory where the mounted hard disk is located, or the full path should be prefixed to the above commands (for example, /mnt/linux/ if using the rescue disk).

The rescue disk also has a Master Boot Record recovery tool written for it, which it explains during the login process.

More than a handful

Handhelds are simpler than their desktop counterparts but far from infallible. *Gavin Maxwell* and *Jenneth Orantia* explain how to deal with the most common handheld emergencies.

There's a wealth of material about the tricks and techniques for handling a desktop or notebook when things go awry. But look for advice on what you can do when it happens to your handheld, and you're likely to come up short.

Considering how quickly you come to rely on your handheld for staying organised, how would you feel if all that information went missing in action?

Here's how to steer clear of disaster, or get back on the road after it.

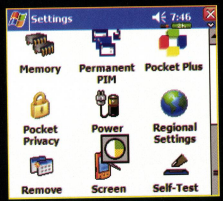
REACH FOR RESET

One of the most common handheld emergencies is when the device becomes unresponsive to stylus taps. This is usually due to an error in an application that neither the app nor the operating system can recover from.

First, try a soft reset. This resets the dynamic memory but leaves all apps and data intact, much like a computer reboot.

On the Palm OS, a system lockup is evident when a Fatal Alert dialog box appears. Tapping the reset button displayed in the dialog usually forces a soft reset. Another method is to push the reset switch with a pin.

At times, this alert doesn't function, indicating a more severe crash. In this case, attempt a warm reset by pushing the reset switch in conjunction with the scroll-up button.



▶ ***Left out in the cold:*** *if the wait icon seems to be in no hurry to stop spinning, chances are your Pocket PC is frozen.*

The last resort is a hard reset, to wipe the device of all third-party software and data, leaving only the built-in apps and OS. This can be attempted by pressing and holding the power button, pressing and releasing the reset switch and, when you see the Palm startup logo, releasing the power button. An "Erase all data?" dialog should appear.

If a buggy application caused the need for the hard reset, first find your HotSync Backup directory and move everything in it to another directory. Restoring the files exactly as they were isn't the best route, as it may replicate the problem causing the lockup. It's advisable to transfer files back into the HotSync Backup directory gradually to enable you to pinpoint the problem's cause.

Performing a HotSync after each addition will determine if the problem still exists. In Windows, your backup directory should be in C:\Program files\Palm\<USERNAME>\Backup. For Mac OS X users, it's in Documents:Palm:<USERNAME>:Backup.

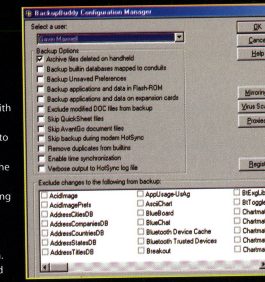
SPINNING OUT

On a Pocket PC, a system freeze is evident when the wait icon spins indefinitely.

Try a soft reset first by depressing the soft reset button. If this doesn't rectify the problem, the alternative is a hard reset, the procedure depending on the design of the particular Pocket PC. Look for instructions in the manual.

A hard reset can happen spontaneously if the system crashes irrecoverably. Also, when a handheld's batteries are fully discharged, a hard reset isn't far behind.

On most Palms and Pocket PCs, a hard reset doesn't happen immediately after a full battery discharge — there's usually a wait which can range from a few minutes to several hours.



▶ ***Safety net:*** *BackupBuddy and Pocket Backup Plus store your precious data on a PC or memory card.*

NO-SWEAT BACKUPS

Regularly backing up files is a function of basic computing, but many people neglect to do it. And the best method of dealing with a crisis is to have a current backup ready, particularly when the only way to recover your device is with a hard reset. Your data is easily restored, and you don't break out in a cold sweat.

Most Palm data is backed up to the computer at each HotSync via a variety of conduits each responsible for handling specific files. However, some databases and apps fall through the cracks, meaning that a restore via the HotSync backup won't recover all the lost information.

But there are numerous third-party utilities to provide more comprehensive backup solutions. The best is BackupBuddy (**www.bluenomad.com**), which initiates with every HotSync session and backs up every file on the Palm.

Apart from backing up all your data to a computer, you can do it to a memory or expansion card. With a card, you restore your device independently of your computer.

Options include Palm's Backup Card with automatically launched software that copies all of the Palm's data onto the card. Alternatively, you can use tools such as BackupBuddyVFS, CardBackup or Botzam Backup in conjunction with a memory card.

By default, ActiveSync, the Palm's synchronisation manager, doesn't back up data on a Pocket PC automatically. This function can be enabled by opening ActiveSync and going into Tools, Backup/Restore and checking the "Automatically back up each time the device connects" box.

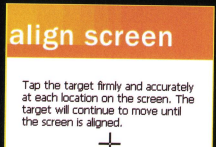
You can choose to do a full backup each time or an incremental one on information that has changed since the last session. If you intend to enable automatic backups at each ActiveSync session, choosing the incremental process is recommended to save time.

The drawback with initiating automatic backups is that the process can be time-consuming if connecting to the computer via USB or serial.

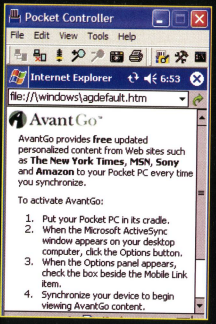
A better solution is using a program such as Pocket Backup Plus (**www.spritesoftware.com**). This lets you back up a Pocket PC to a computer, network share, storage card or even the device itself, and it does the job much quicker than ActiveSync.

Scheduling a backup at least once a week reduces the impact of a hard reset. Using BackupBuddy on a Palm means that backups are created on every HotSync, which is good if you regularly sync to the computer.

Pocket Backup Plus for Pocket PC allows you to schedule daily, weekly or one-off backups for launching automatically at the specified time.



▶ ***Finger feed:*** *recalibrating the digitiser takes only a few taps on the screen.*



▶ ***Back to base:*** *Pocket Controller allows manipulation through a regular computer.*

DIGITISER DRIFT

After a period of time, or even in certain weather conditions, the onscreen digitiser that recognises stylus taps and strokes can drift out of alignment. When this happens, the handheld will incorrectly interpret your actions. If the digitiser drift is severe, it can stop you from using the device altogether.

On a Palm, the necessary recalibration is achieved by going to the Prefs application and selecting Digitizer from the pop-up menu.

The same can be accomplished on a Pocket PC from the System settings. Selecting the Screen application allows you to realign the screen so the digitiser interprets stylus taps accurately.

On occasion, however, it becomes impossible to access the Prefs application because you can't tap the pop-up menu correctly. To remedy this on a Palm, AutoDigi2 (or AutoDigi5 for Palm OS 5 devices) has a swag of options for ensuring that your pen calibration stays in tune.

SCREEN WORKAROUND

Pocket PCs don't have any specialised digitiser tools, but a workaround can be applied if you're unable to get to the Screen application.

Pocket Controller (**www.soti.net**) allows remote manipulation of your Pocket PC through a computer, projecting a "virtual Pocket PC" onto your computer screen. You can open the Screen application through this program and then recalibrate the digitiser on the Pocket PC itself.

If recalibrating the digitiser offers no respite, it's likely that the problem is hardware-related. This can happen if the device has been dropped or suffered some other hard impact. In this case, you'll need to consult the manufacturer about getting the digitiser replaced.

HotSync troubleshooting

Palm devices are sometimes unable to perform a HotSync. Here are the most common ways around the problem.

1. **Ensure HotSync is set up to monitor the port you're trying to connect to by right-clicking the HotSync icon in the system tray and ensuring the correct transport is selected (e.g. serial, USB, network). If using a serial, modem or network connection, select Setup from the pop-up menu and ensure the settings are correct for the port.**
2. **Check no other software uses the port HotSync is trying to use. Fax software is often the culprit.**
3. **If using a USB connection via a USB hub, make sure it's a powered hub. Non-powered hubs often cause problems with the HotSync signal getting through. Using a direct USB connection could help.**
4. **If getting timeouts during long HotSync sessions, try opening the HotSync application on your Palm and, while holding the scroll-up button, tap on the top right-hand corner of the screen. This will force your Palm to wait for the PC to finish its tasks.**
5. **While most of the problems with HotSync occur at the desktop, it's possible for software such as keyboard drivers on your Palm to get in the way. If they are suspect, try disabling them.**

For troubleshooting tips on ActiveSync, see *APC* May, page 146.

One small step...

Now that you're on the home stretch, it's time to troubleshoot the network and safeguard your system with regular backups.

***Matt Overington* explains.**

7. Network troubleshooting

Your PC's working perfectly: no crashes, no device conflicts, and no obvious signs of error, but the network isn't functional. Internet Explorer won't load pages and your PC isn't registered on your home network.

The first thing to check is your network device. Is it working correctly? Open the System Properties box from the Control panel and click on the Hardware tab. Click on the Device Manager box to show a list of the installed components. Any incorrectly configured hardware will be flagged with an exclamation mark.

If your network device is displaying an error, double click on its entry to open the Properties box. Information on the error will be listed in the Status box. Check that you've got the latest driver for each hardware component and visit your manufacturer's Web site for any updates. Download and install any new patches from the manufacturer's site and reboot your computer.

If the network still isn't functional after you reboot the machine, launch a DOS session by typing command into the Run box on the Start Menu. Verify that TCP/IP network drivers are functioning correctly by typing ping 127.0.0.1 at the prompt. If the network is functional, you'll see a list of times taken for the ping data packet to reach the local host. If not, the PC will generate an error message.

In the case of the former, you can move on to testing with Internet Explorer, but if the ping command returned an error, you'll need to install TCP/IP support.

Start by clicking on either the Network or Network Connections icon under the Control Panel. Recent versions of Windows will run through a wizard to help you install drivers based on your connection method, but you'll have to manually add the appropriate ones under Windows 95, 98 and Me. Detailed information on installing networking drivers for Windows 95 can be found at **www.oreilly.com/catalog/netpc/excerpt/ch06-02.htm**. Note that the information contained there also relates to subsequent 9x-strain releases.

TESTING WITH INTERNET EXPLORER

Open Internet Explorer and click on the Internet Options item under the Tools menu. Click on the Connections tab and check the configuration options under LAN settings. If your ISP relies on a proxy, make sure you've got the right settings from them before you attempt the configuration. If you're unsure, call your ISP's tech support line and ask. They should walk you through the changes you'll have to make.

8. Backup

The best defence against a system failure is to backup regularly. A massive range of software solutions are available, from the OS-integrated backup tools to total system-snapshot applications like PowerQuest Drive Image (see review in On Test, page 44).

Hardware backup utilities like the DynaBacker (see review in On Test, page 50) enable the user to automatically save data to a pair of removable hard disks while a RAID array provides the ultimate real-time data protection (for details on how to build your own RAID array, look to "Host your own RAIDing party" on page 130).

It only takes five minutes to create a boot disk and store it in a safe location. You may never end up needing it, but having one handy will save hours of messing around in the event of a crash.

If you're using Windows 2000 or XP, you can rely on the boot disk builder under the Accessories branch of the Start Menu. Click on the Backup application under the System Tools sub-menu and switch to Advanced mode. Click on the Automated System Recovery icon and follow the prompts to create a set of boot disks containing your personal settings.

If you're using Windows 95, 98 or Me, manually create a disk or use the boot disk that came with your original installation CD-ROM. Detailed information on how to create a boot disk for earlier versions of Windows is at **www.everythingcomputers.com/windows_boot_disk.htm**.



▶ ***Protect yourself:*** *you can use a hardware utility like the DynaBacker to automatically back up your data.*

Bootable Cover CD



No boot disk? No worries. We've constructed an emergency recovery CD and bundled it with this issue.

If your machine turns up its toes, just set your BIOS to boot from the CD-ROM and restart your computer with the disc in the drive. A special *APC* recovery menu appears that enables you to perform a number of disk and file functions without dropping to a prompt.

Old hands with DOS experience may prefer to work directly from the command line, so you can press X to spawn the shell. We've bundled tools to copy, move, edit and undelete files on FAT and NTFS partitions, so you'll can be back up and running in minutes. Your PC need never suffer startup problems again.

WORKSHOP

Hands-on with hardware and software, plus bonus CD content

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Whatever you think , one day you *will* need to reinstall Windows. James Bannan shows how to take the pain out of the process.

124 **Community wireless networks**
Imagine a free broadband connection five times faster than ADSL. *Dan Warne* explains how you can hook up to precisely that.

126 **Programming with Python**
Python is a high-level, dynamically-typed, object-oriented programming language. *Sam Tardif* reveals why every coder should have it in their arsenal.

130 **Build your own RAID**
Is your hard disk slowing down? *Matt Overington* builds a Redundant Array of Inexpensive Disks that'll make your storage subsystem fly.

132 **Build a password-protected Web site**
Steven Noble shows you how to add a members-only area to a Web site using PHP, MySQL and the Apache Web server.

135 **PowerQuest Drive Image**
Safeguard your system with Drive Image 5, a versatile utility that's free on this month's cover CD set. *Matt Overington* explains.

136 **3D modelling with Blender**
With the opening of the source code to NaN's Blender, 3D modelling is no longer restricted to those with PhDs, writes *Ashley Harris*.

139 **Create personalised Smart Tags**
Stephen Withers makes personalised XML Smart Tags that link Office XP docs to Web-based resources.

140 **Web graphics with CSS**
James Bannan demonstrates how to reduce code and create professional positioning and graphic effects with CSS (Cascading Style Sheets).

142 **Photoshop layer styles**
Trevor Morris uses Photoshop to produce graphic, Mac-style buttons on a single layer.

144 **JavaScript bookmarklets**
Cut the junk from Web pages and view them the way you want with JavaScript bookmarklets. *David Williams* explains.

Bonus CD software

Most Workshop articles are accompanied by bonus software loaded onto our cover CD set — just look for this icon. This is often software that's integral to the article. The selection ranges from full-working versions and trial versions to shareware and freeware.

***APC* cannot provide tech support for these programs, but if you have a problem with the CD itself, by all means holler our way (see pages 10-11 for how to contact our CD team).**

www.bink.nu



Love it or loathe it, we all have some sort of relationship with Windows. Microsoft's moves and shakes largely determine what you run on your computer, even if recent marketing decisions have pushed you to try alternative OSes. Linux users can't afford to ignore developments from Redmond, especially as it's targeting the businesses it is in danger of losing to Linux. The Bink.nu site (formerly ***www.WindowsXP.nu****) is one of the best unofficial sources of Microsoft info available. Codenames, release schedules, news, tips and informed comment are all there in plain English. Steven Bink, a Dutch Windows 2000+XP MCSE and MVP holder, maintains the site.*

Bonus CD software
BackRex Expert Backup 2.3, IsoBuster 1.4, WinDriversBackup 1.0, XP Anti-Spy 3.71

Secrets of the reinstall masters

Love it or loathe it, one day you'll need to reinstall Windows. *James Bannan* reveals the smartest ways to streamline the process.

You try to keep your system clean and only install the apps needed, but in the end you'll have to face facts: reinstalling Windows is a necessary evil. Be it a last resort for fixing a creaky PC, starting afresh after a system crash, buying a new machine or installing a hard drive — there's no way around it.

How you perform the reinstall makes all the difference. It takes days if you follow the numbers. But old hands know how to streamline the process from start to finish and it can even lay the foundations for simplifying their next inevitable reinstall. Here's how to join the ranks of the "Reinstall Masters" of Windows 9x, 2000 and XP.

SAVE YOUR FILES

If your hard drive heads south, taking all your data with it, there's little you can do but insert the Windows CD between sobs.

Under happier circumstances, you should start by safely stowing away your work, plus as many software settings and customisations as possible. Burning essential files and folders onto CD is a relatively slow choice, and even with the low price of CDs, it can be a drain on the wallet.

One reason external USB 2.0 and FireWire hard drives are so popular is that they're perfect for quick-and-dirty backups.

The humble XCOPY command becomes useful here: open a command window, navigate to the folder to be backed up and type:

```
xcopy *.* x:\backup\folder /e /c /i /h /k
```

where x:\backup\folder is the folder in the backup directory on the external drive that the current folder is to be backed up into. This copies the entire structure of the folder, including subdirectories, hidden files and file attributes.

Run from c:\, it will back up the entire contents of the local drive. There are more switches applicable to the process — xcopy /? will display the full list. This process works just as well when the backup destination is a mapped drive on a local network.

Another option is Windows Backup, usually found under the Start Menu's Accessories, System Tools folder (except for XP Home, where it must be installed from the CD's VALUEADD\MSFT\NTBACKUP folder). It backs up to an external drive or CD, and the resulting BKF file is compatible with the Backup applet in all versions of Windows.

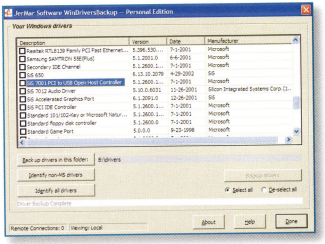
The shotgun approach is to take a snapshot of the entire partition or drive, using an application such as Norton Ghost or PowerQuest Drive Image (a full version of Drive Image 5.0 is included on this month's cover CD set), and then selectively reload data from the relevant folders after reinstalling Windows.

Some users also favour such utilities as WinDriversBackup (also on the cover CDs) to save all drivers installed on the machine, rather than digging out the original CDs or hunting down the latest drivers online.

WinDriversBackup lets you choose which drivers to back up, such as only the non-Microsoft drivers (the ones not loaded by Windows itself), to keep the overall backup to a manageable size.

However, only the base driver components (such as the INF, SYS and DLL files) are saved. Should the driver have a specific installation package with extra features, such as nVidia's Detonator pack, the whole program must be installed.

That's why many people prefer to skip this step and just download all the drivers themselves.



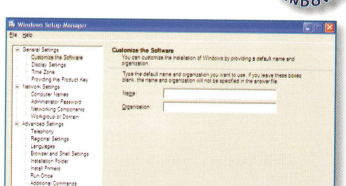
Drive safely: *WinDriversBackup identifies all currently installed drivers.*

Alternate installation points

Windows doesn't have to be installed from a CD. There are alternative installation points on network drives and external hard drives. These can be especially convenient when slipstreaming Service Packs, updates and drivers into the installation process, as the alternate install point can be modified dynamically. This means you don't have to recreate the installation CD every time a driver is updated.

Reinstall Windows using this option and you'll need boot disks with network, USB and FireWire DOS support . Norton Ghost 2003 has wizards for creating these types of disks, and the DOS drivers are online.

A good source of boot disk images — and much more for the reinstaller — can be found at *www.bootdisk.com*.



Set 'em up: *the Windows XP Setup Manager makes it easy to duplicate your system configuration for a speedy reinstall.*

SAVE YOUR SETTINGS

A variety of system customisations, such as regional and network settings, can also be saved and later applied to the fresh-baked Windows installation.

For Windows 98SE, dig out the Windows 98SE CD, dive into the \tools\reskit\batch folder and install Batch98. This utility collects information such as the Product ID, user and network information from your current Windows installation and saves the settings to a file called msbatch.inf. This INF file can be incorporated into the reinstallation process to allow for an unattended installation, skipping prompts for setup options by applying your responses based on the data in msbatch.inf. Batch98 isn't included with Windows Me, although the 9x program itself runs fine under Me.

Windows 2000 and XP sport a more advanced Setup Manager, found in the installation CD's \support\tools\deploy.cab file. Extract the contents of deploy.cab to a local folder and run setupmgr.exe. You'll be prompted to supply details such as your time zone, administrator password and networking settings. The wizard generates an answer file, unattended.txt, which as the name indicates, can be used for unattended installations.

These methods speed reinstallation but don't collect all the relevant settings and customisations, such as custom file associations and personal desktop and Explorer settings.

Some third-party applications do an excellent job in this area. The BackRex suite of products scans the current installation and can back up registry settings and customised settings for Windows, IE, Outlook and Office products, as well as Favorites and My Documents. A demo version of BackRex is on this month's cover CDs.

If you're running Windows XP, one of the best backup options is XP's own Files and Settings Transfer Wizard. This comprehensive utility automatically backs up a large range of settings for the OS, installed application settings, file associations and folders. You can also modify the default backup list.

The wizard can run simultaneously on two connected computers (using a boot disk it creates), so files and settings transfer directly; or the backup can be placed onto an external or network drive using an image file format similar to Ghost and Drive Image.

The wizard is run again after Windows XP and your applications have been reinstalled, and the system returns to its former configuration.

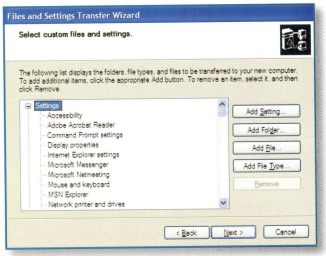
DOWNLOAD WINDOWS UPDATES

One of the most tedious tasks when reinstalling Windows is downloading the patches and Service Packs via the Windows Update site. Thankfully, there's a way around it. Before you reinstall Windows, head to the Windows Update Catalogue

Do the nine-step 9x backup

With 9x, this simple method works a treat. It allows for a completely fresh install of the OS without laboriously backing up files and folders. The only caveat is that you'll need up to 1GB of disk space, although you can reclaim a lot of it at the end of the process.

1. Create a startup disk using the Control Panel's Add/Remove Programs applet.
2. Open the Windows, Command folder and copy the MOVE.EXE file onto the startup disk.
3. Copy the contents of the Windows 98 CD-ROM's Win98 folder onto the hard drive (using a directory such as c:\win98).
4. Boot from the system disk and at the DOS prompt type the command `move c:\windows c:\bakwin` (assuming your OS is in the default c:\windows folder). Watch for the response `C:\WINDOWS => C:\BAKWIN [ok]`.
5. Type `move c:\progra~1 c:\bakprog`, which repeats the process for the Program Files folder (`c:\progra~1` is the 8.3 DOS version of this long folder name). Again, wait for the confirmation message.
6. The Windows and Program Files folders have now been renamed to BAKWIN and BAKPROG. This saves you from copying their contents onto CD or an external drive, and moves them out of the way so a fresh Windows install can take place.
7. Reinstall Windows 9x from the DOS prompt by switching to the C: drive and running Setup.exe from whatever location the 9x CD files were copied to. The setup wizard will probably detect the copy of Windows sitting in the C:\BAKWIN folder and suggest it be installed there. Click the button labelled Other Directory and instruct the wizard to install Windows 98 into the usual C:\WINDOWS folder. This ensures that no junk files from your old Windows folder find their way into the new installation.
8. When the setup is complete, reload your applications as per usual and browse through the BAKWIN and BAKPROG folders to pull out your files, bookmarks, fonts, WAV sounds, document templates, email folders and so on, and copy these into their new, clean-as-a-whistle locations.
9. Once you've returned all the vital files to their proper locations, delete the BAKWIN and BAKPROG folders (and the copy of the Windows 98 CD, if you wish) to reclaim maximum space on your hard disk.



Wizardry in action: *even Muggles can use the XP's Files and Settings Transfer Wizard to save unique system settings.*

site at **http://v4.windowsupdate.microsoft.com/en/default.asp?corporate=true**.

This site allows users to create a list of downloads, which are added to a "basket" and downloaded to your PC as a set of packaged applications. These can be burned onto a CD or copied to an external or network drive and run after reinstalling Windows.

It's especially handy if you're upgrading a home PC and have only a dialup connection, but have fast Net access at the office. You can fetch these files at high speed, then ferry them home on a CD or portable hard drive.

This process requires a little advance planning because the site lists all updates available for download, rather than just the updates you need to install, as is the case with the regular Windows Update service. So if your planned Windows installation includes a Service Pack, many of these updates won't be necessary.

MERGING WITH THE SLIPSTREAM

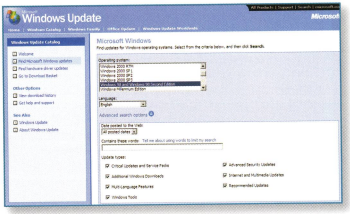
"Slipstreaming" is a great way to speed up reinstallation of Windows 2000 and XP. It involves merging one or more downloaded Service Packs with the installation files from the original CD, then burning these onto a new CD.

When installing Windows from this CD, the Service Pack updates are automatically applied.

The first step in creating a slipstreamed CD is to copy the entire contents from the installation CD to a local folder (such as c:\xp). Then unpack the files from the downloaded Service Pack into a local folder (such as c:\xp-sp) by opening the folder containing the Service Pack and using the command winxp-sp1.exe –x.

Finally, at the command line, enter:

```
c:\xp\i386\update\update.exe /s:c:\xp-sp
```



Grab and go: *use Microsoft's Windows Update site to download Service Packs and patches for later installation, or for slipstreaming onto a CD.*

to merge the Service Pack files from the c:\xp-sp folder with the original Windows XP files in c:\xp.

The next logical step is to make the CD bootable. Use a tool like IsoBuster (on this month's cover CD set) to extract the boot sector from the Windows XP CD.

Run IsoBuster, select the Bootable CD folder and right-click Microsoft Corporation.img. From the menu, choose Extract Microsoft Corporation.img and save the IMG file.

Next, open your CD burning software, choose to create a bootable CD without emulation (most CD writers support this) and specify the IMG file from the XP CD. Also change the number of loaded sectors from 1 to 4. This option varies between applications, but the default is always 1, and it needs to be 4 to make the disc bootable.

Give the CD the same name as the original disc and burn the contents of the c:\xp folder.

WELCOMING WINDOWS UPDATES

Individual Windows Updates can't be slipstreamed into the Windows installation in the same way as Service Packs.

However, update packages can be copied into their own folder on the installation CD, and the Setup Manager can be configured to execute them after the installation is complete. Note that this process will work only for Windows 2000 and XP.

Create a folder under c:\xp\$OEM$\$1 named Updates. Its subfolders will contain the Windows Update files to be run during installation.

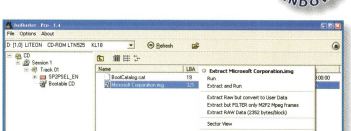
Then, when the Setup Manager wizard runs, go to the Additional Commands step and add the commands necessary to point to the update packages.

For example, if the .NET Framework is being installed and the dotnetfx.exe package has been added to c:\xp\$OEM$\$1\updates\dotnet\, then the command would be:

```
\updates\dotnet\dotnetfx.exe /Q:A /R:N
```

(These switches ensure a silent install with no reboot.)

This process creates a file called cmdlines.txt. Copy this to c:\xp\OEM and the unattended installation process will install .NET.



Logical step: *use IsoBuster to extract the boot sector from the original Windows CD so your slipstreamed CD will also be bootable.*

SLIPSTREAM NON-MICROSOFT DRIVERS

Non-Microsoft drivers can also be added to your installation process. For Windows 98SE, use the INFInst tool from the CD's Tools, Reskit, Infinst folder. Copy the contents of the Windows 98SE CD to a local or network folder — this will become the new setup point.

Next, copy the drivers to a folder within this point. Run the INFInst tool, and it will prompt for the location of the INF file to be added, and the location of setup.exe.

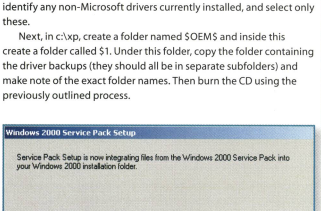
Browse to setup.exe in the new setup point, and then to the location of the INF file for the driver to incorporate into the Windows 98SE (or Me) installation. INFInst modifies the custom.inf file in the setup point to incorporate these drivers, and when Windows is installed from this setup point, the drivers will be included.

A full description of the INFInst tool can be found by searching Microsoft's online Knowledge Base at **http://support.microsoft.com**.

To ad non-Microsoft files to a Windows 2000 or XP setup, use the Setup Manager's unattended answer files. This also involves modifying the installation point, and can be done in conjunction with slipstreaming a Windows Service Pack into the original CD.

First you need the extracted drivers. Use WinDriversBackup and identify any non-Microsoft drivers currently installed, and select only these.

Next, in c:\xp, create a folder named $OEMS and inside this create a folder called $1. Under this folder, copy the folder containing the driver backups (they should all be in separate subfolders) and make note of the exact folder names. Then burn the CD using the previously outlined process.



Fresh-baked: *slipstream files from a Service Pack into the original installation to create a new and up-to-date Windows CD.*

Take the unattended.txt file created by Setup Manager and rename it to winnt.sif. Edit the file using Notepad and add the following lines to the [Unattended] section:

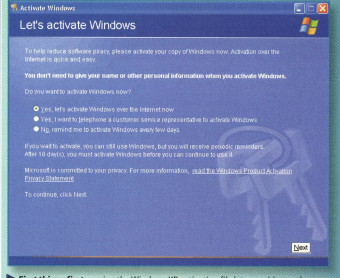
OEMPnpDriversPath="drivers\video;drivers\audio;drivers\nic"
OEMPreInstall=Yes (you may only need to change the existing value)
DriverSigningPolicy=Ignore

This assumes that the driver subfolders have been placed in c:\xp\$OEMS\$1\drivers and the subfolders are called video, audio, nic and so on. If the folders are called something else, change the values in OEMPnpDriversPath. Copy winnt.sif to a floppy disk.

When you're ready to reinstall Windows, have this disk sitting in the drive. The Windows CD will reference the answer file and the non-Microsoft drivers will be used during installation.

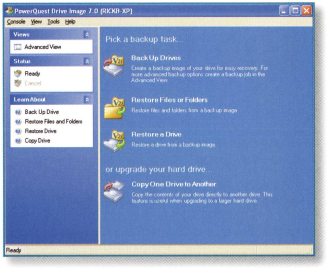
Saving Windows XP activation code

When activating Windows XP, the information is saved in the wpa.dbl file (found in the c:\windows\system32 folder). This can be saved before reinstalling Windows XP, then copied back to the same folder afterwards. You may need to be in Safe Mode, and if you make any changes to the hardware, you'll need to reactivate XP.



First things first: *saving the Windows XP activation file lets you sidestep the reactivation routine when reinstalling the OS.*

Head start: *use a utility such as Drive Image to make your next reinstall even easier.*



UNATTENDED INSTALLATIONS

With your files safely stowed away, your slipstream CDs created and batch install or answer files at hand, you're ready for the smoothest Windows installation you've ever experienced.

For Windows 98, the msbatch.inf file created by Batch98 comes into play. The file needs to be placed in the setup folder of the installation point, so you might want to add this to your fresh-baked Windows CD.

Another method is to save msbatch.inf to a floppy, boot into DOS with CD support, and type:

```
d:\setup.exe a:\msbatch.inf
```

This prompts the setup process to use the answer file on the floppy.

The installation process for Windows 98SE and Me doesn't prompt you to format the hard drive, so this isn't a component of the unattended install. If you're performing a clean installation, the hard drive will need to be formatted. If the drive was previously formatted with FAT or FAT32, it can be quick-formatted (format c: /q). For other file systems such as NTFS, you'll have to use FDISK to remove the non-DOS partition and create a new one before formatting the drive.

The unattended installation will stop only when it prompts for a username and the product key. But if you entered this data using Batch98, these fields will already be filled in, so you can simply click past them.

When running the Setup Manager under Windows 2000 and XP, you'll need to add a few entries to the winnt.sif file. In the [Unattended] section, add the parameter Repartition=Yes. This will erase the hard drive and reformat it with NTFS. If the hard drive is to contain multiple partitions, this value shouldn't be added and a manual selection will have to be made.

Next, in the [UserData] section, add the parameter:

```
ProductID="aaaaa-bbbbb-ccccc-ddddd-eeeee"
```

where the letters correspond to the product key of your Windows installation CD. This prevents the installation from stopping when you're asked for the product key. The unattended.doc in the deploy.cab file gives a full listing of all the options available for the winnt.sif answer file.

Have the floppy disk containing winnt.sif in the computer when it's booted from the installation CD. The CD automatically checks for the presence of an answer file at the installation point, and then the floppy drive.

If you're reinstalling Windows XP and your hardware configuration has changed, you'll need to reactivate the software. This can be done during the unattended installation, provided the machine is connected to a network with Internet access.

In the [Unattended] section, insert the value AutoActivate=Yes and make sure the ProductID value is in the [UserData] section. If the machine you are reinstalling XP on (via a modem or PPPoE LAN connection) handles your Internet connection, this step won't work in the unattended process.

TAKE A SNAPSHOT

Once Windows has been reloaded, you should consider taking a snapshot of the new installation using Drive Image. This gives you the cleanest working backup of the entire system configuration, without any applications to bloat the size of the image file.

There are a couple of tasks to perform before snapshooting, the first being to defragment the hard drive.

There's minimal fragmentation after Windows has been installed on a freshly formatted hard drive, but it's worth doing just the same. If you're running Windows XP, disable hibernation mode to remove the hibernation image file from the drive. Install XP-AntiSpy (from this month's cover CDs) and set it to clear the pagefile on shutdown. These steps can substantially reduce the image file.

Take the snapshot and stow in a safe place.

Now you can reload your applications and settings, and restore your data. If drivers and settings were backed up using a third-party application, these will need to be reinstalled first. If XP has been installed, use the Files and Settings Transfer Wizard to restore the previous Windows configuration.

You might like to take a second image of the system at this stage. It will be much larger than the first because it will contain all the new applications and files.

But it's good to have both this and the fresh-install image in case of an emergency. EOT

DOS compatibility for Windows XP

As you've probably discovered during an earlier reinstall, Windows XP's Setup.exe won't run in DOS mode. To start the XP setup from DOS, navigate to the \i386 folder (on the XP CD, by using a boot disk with CD support, or if you've copied the files onto the hard drive) and run winnt. This runs a DOS-compatible 16-bit Windows XP installer.

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Bonus CD software
Ministumbler and Netstumbler programs.

Community wireless networks

A free broadband connection that's five times faster than ADSL? *Dan Warne* explains how to hook-up to your local community wireless network.

If you like the speed and always-on nature of broadband but don't want to be tethered by an Ethernet cable, or even the short-range of your home Wi-Fi network, community wireless networks could be the answer. These are groups of enthusiasts using specialised antennae to extend the range of their own 802.11b wireless networks so that they link into each other, creating large-scale networks that can span from suburbs to cities.

The coverage is far from extensive, something wireless groups admit, but the benefits are: freedom from download limits, local LAN speeds, and the satisfaction of setting up your own wireless connection. Not to mention advantages like super-fast file sharing, video streaming between friends and high-quality voice over IP. The same equipment and techniques can also be used to connect directly to a friend nearby, regardless of community wireless coverage in your area.

With a bit of judicious shopping, you could be shuttling files through the airwaves at 11Mbit/s for as little as $300.



Degrees of separation: *Web sites like nodedb.com display community wireless nodes in your area.*

PLOTTING YOUR COORDINATES

The first step is putting yourself on the map, or rather the NodeDB database. This lists everyone who runs community wireless access points (nodes). Most wireless groups use this database but some run their own, so you'll need to check your local group's Web site (see table below for wireless community groups around Australia).

Assuming your local group does use NodeDB, go to **www.nodedb.com/australia** and register. Navigate through the regional menus to your area and select Create a new node entry.

You'll need the latitude and longitude of your residence to plot your position on the node map — fortunately, there's a Web site (**http://nodedb.com/australia/nsw/sydney/whereis.php**) that transforms addresses into GPS coordinates for you.

Plugging these coordinates into your node entry form puts you on the map, and gives you the ability to view nearby nodes.

WHAT YOU NEED

To get started you need a Wi-Fi certified 802.11b PC Card with an external antenna connector, otherwise you won't be able to get the range necessary to connect to a community wireless network. It's also wise to get a card that supports 128-bit WEP security.

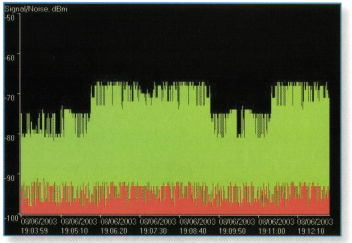
If your laptop has built-in wireless networking but no antenna connector, get a wireless access point with an external connector. Desktop PCs can also be outfitted with PCI wireless network cards (starting at $100), or PC Card adaptors (starting at $80). Although the latter solution is a little more expensive, you can reuse the wireless network card in a laptop.

The next step is hooking up an external antenna — see last month's Workshop section (*APC* July, page 144) for more details.

As 802.11b wireless networking transmits on the same frequency as microwave ovens and digital cordless phones, it's extremely important to use shielded microwave-grade cable between your PC and your roof-mounted antenna. Expect to pay about $5 per metre

Neighbourhood wireless groups in Australia

ACT	Canberra Wireless Network	**www.air.net.au**
NSW	Sydney Wireless	**www.sydneywireless.com**
NT	Alice Springs Wireless	**alicespringswireless.org.au**
	Darwin Wireless	**www.darwinwireless.com**
QLD	Brisbane Mesh	**www.itee.uq.edu.au/~mesh**
	Cairns Wireless	**cairns.wireless.org.au**
	Gold Coast XTreme Wireless	**www.xtreme.com.au**
SA	Air-Stream Wireless (Adelaide)	**www.air-stream.org**
	Adelaide Wireless Network	**www.adelaide.air.net.au**
TAS	Tasmanian Public Air-Wave network	**www.tas.air.net.au**
VIC	Ballarat Wireless	**www.ballaratwireless.net**
	Bendigo Wireless	**www.bendigowireless.net**
	Geelong Wireless	**geelong.wireless.org.au**
	Melbourne Wireless	**melbourne.wireless.org.au**
WA	WAFreeNet	**www.wafreenet.org**



Give me strength: *Netstumbler is a handy tool to check the signal strength of your wireless connection.*

— your local wireless group should be able to help you track down shops that sell products like Times Microwave LMR-400 or Andrew CNT-400 cable. Try to use less than 15 metres of cable, as your signal strength will drop by half if you exceed this distance. Ask if the shop that sells the cable can add the right connectors to either end: one for your antenna, and one for the "pigtail" that leads to the network card.

The pigtail is a short piece of cable that's smaller and more flexible than a main microwave cable (which is usually quite stiff). One end of it connects to the microwave cable, and the other to the wireless network card. There are two tricks to a good pigtail: getting the right connectors on both ends, and keeping it as short as possible (under 30cm) to minimise signal loss. Ask a shop to help you determine the right connectors for either end, and expect to pay around $40-$50.

A wireless access point is optional, as you can run a cable directly from your PC to your roof-mounted antenna. But most prefer to use their wireless link around the home. A plain wireless access point starts at around $170, but if you're thinking of purchasing an ADSL broadband Internet connection, consider one that integrates an ADSL modem, wireless access point and network switch. You can pick these up for around $300-$500.

WHERE TO GET YOUR GEAR

802.11b wireless networking gear can be found at most major computer retailers and online computer shops. However, you can often pick up bargains from wireless community groups' Web sites. Melbourne Wireless runs "The Incredible Bulk" service (**http://melbourne.wireless.org.au/tib.php**). It allows members to get together and advertise to vendors that they're willing to buy a certain amount of wireless equipment — but only if the vendor comes to the party with a certain price.

This has resulted in some amazing bargains including 802.11b PC Cards for $55, and good quality external antennae for just over $100.

PUTTING IT TOGETHER

As all microwave transmissions need some line of sight, determine the best place to position your omni-directional antenna — obviously, putting an antenna on the wrong side of a chimney will limit its potential.

Determining line-of-sight isn't rocket science. Standing on your roof at night and shining a very bright torch in the general direction of the person you are trying to connect to, should do the trick.

Failing that, you can try working the NodeDB numbers. Once you've entered your details into the database you can see other nodes around you, including the exact compass bearing from your house (e.g., 45° means 45° from north). Another trip to your rooftop with a compass should quickly show you where to position the antenna (and the exact direction to point it if you're using a directional antenna). Once you've installed the antenna in the right spot, the fun begins.

Connect the coaxial microwave cable to the antenna and string the cable through the house to your computer. Then connect the cable to the pigtail, and the pigtail to your network card or access point.

Although you can use Windows XP's built-in signal strength metering, freeware signal metering software such as NetStumbler gives you a detailed graph with more useful information.

If your signal strength is poor, check that your antenna is polarised correctly — this means whether it's angled correctly (horizontally or vertically).

This makes a huge difference as it makes the microwave wave patterns travel in a different orientations.
For more information about using the right polarisation for different antennae and situations, search your local community wireless Web site.

Onced you've reached this point, connecting to a community wireless network is as simple as connecting to any other wireless network. Under Windows XP go to Network Settings, click the wireless Network tab and then click Add Connections.

Any wireless networks that your card picks up should then appear. EDITOR

Louder, faster, stronger?

There's a strict legal limit of 36dBm on wireless network transmission power, so you need to ensure your setup is below this before switching it on.

It helps if you can find out all the transmission power measurements for your wireless card, antenna and cabling in dBM, as it's easier to work out the maximum transmission power based on these figures. The formula is Wireless Card Power (dBm) + Antenna Gain (dB) – Cable Loss (dB).

For example, if an 802.11b wireless card has a 15dBm maximum transmission power, and is coupled with a 15dBi antenna, that equals a total of 30dBi. The attached microwave cable and pigtail drops that figure a little due to signal loss. With very good quality microwave cable and a short pigtail, you can expect to lose approximately another 1.5dBi, which brings the total to 28.5dBi — well under the limit.

Bonus CD software
Python for Windows, Mac OS, Linux, and sample files.
THIS MONTH'S APC COVER CD

Python: the full monty

***Sam Tardif* shows how to squeeze all you can out of one of the most useful, little-known programming languages around.**

Python is a high-level, dynamically typed, object-oriented programming language. It offers such features as exception handling, high-level dynamic data types and a large selection of modules. It works with a variety of operating systems, including Linux, Windows and Mac OS. Combining elegant syntax with tremendous power, it's a language every coder should add to their arsenal.

The following example solves the Target word game in *The Sydney Morning Herald*. If you don't receive this newspaper, you can find the puzzles online at **www.smh.com.au**. A dictionary file will be used as a list of words, the quality of the file determining the quality of the results of the script. On this month's cover CD set you'll find a dictionary file, but feel free to use your own, and the entire source of this project.

OPEN TO INTERPRETATION

The Python interpreter can be used to execute scripts you have written and saved in a file, or used in interactive mode. Run the interpreter without any arguments or click the icon in Windows, and you are presented with the interactive interpreter.

It's a very handy tool and performs many tasks, from simply working as a calculator, evaluating expressions you give it, to allowing methods and classes to be created. This is great for testing snippets of code that don't seem quite right when developing a script.

To create a Python script, saved on your hard disk so it can be run by the interpreter, you need an editor such as Vim, Emacs or Notepad. If you have the Python IDLE installed, a simple development environment is also available, offering features like syntax highlighting, mass commenting and mass indentation (very useful for Python).

When you've written your script, save it with a PY extension and it's ready to be run by the Python interpreter. If you are on a Windows box and want to make standalone executables that don't require the Python interpreter, the program py2exe, available from the **starship.python.net** Web site, performs the necessary conversions.

PROJECT OUTLINE

The goal of this script is to find as many words as it can from the combination of letters given in a Target puzzle. Rather than step through the code line by line, it's better to give a general description of what the code does and explain the Python features used in writing the code. This will help you to understand how the features function.

The script first prompts the user to input the letters of the puzzle. It stores the centre letter in it's own variable as well as in a list of the other eight letters entered by the user. It checks to make sure it has the right number of characters and then proceeds with analysing the input.

A new object is created that cycles through words in a dictionary, checking to see if each can be made with the letters provided. If the current word can, it keeps it in a list. The words are then displayed to the user, along with the total number found.

THE BASICS

Python supports all the basic data types, such as integers, characters, strings, floating point numbers, and so on. When it comes to arrays, Python has two options to choose from: lists and tuples. A list is an array of objects, but those objects don't have to be of the same data type. Also, a list has no fixed length; items can be appended to it as well as deleted, and the list will shrink or grow to the required size. A tuple is similar to a list, only its items are immutable, meaning you can't change their value after creation. Python also offers a data type called a dictionary, which holds key:value entries much like a hash.

Variable assignment is similar to that of traditional languages such as C/C++, except no end-of-statement character or specific data type for the variable is required. Multiple variables can be created on a single line and each variable can be of a different data type. So we can do this:

```
found, done = 0, []
```

This statement creates two variables: found, which is an integer, and done, which is an empty list.

CONTROL STRUCTURES

Python offers for loops, while loops and if statements. But it doesn't have do...while loops or a switch statement like other languages do.

An if statement consists of the if keyword followed by the conditional statement. This statement doesn't have to be surrounded in parentheses as in other languages, but it is possible to do this if it is needed or wanted. Relational operators such as ==, !=, <, >, <= and >= can all be used. At the end of the if statement, a colon is required. This begins the new code block.

This is where what is perhaps Python's most striking feature comes into play — the fact that whitespace matters. Code blocks for if statements, while loops, methods and so on are created using indentation. Some may recoil in disgust, but it's actually a great feature that makes the readability and maintainability of Python code a great deal easier — especially if you're reading through code that someone else has written.

This project's code doesn't contain while loops, but numerous for loops are used. The in keyword is also used with all the for loops, so this will also be explained.

And for loops are easy to use. An example from our code is:

```
for item in line:
```

In this example, the variable line represents a string of characters. The item variable temporarily holds each character in the line variable as the loop iterates over it. The for loop can be used on any sequence, such as a string of characters or list of numbers.

USING MODULES

The standard Python distribution comes with a wide range of modules to use. This project uses only one, the sys module, which allows you to use various methods and values associated with the interpreter.

Modules are imported using the import keyword. The name of the module immediately follows it. Importing the sys module looks like this:

```
import sys
```

Some other modules are string, math, random, ftplib, and the list goes on. You access the methods or variables belonging to the sys module using the dot operator (.), like this:

```
sys.exit(1)
```

Here the exit method of the sys module has been called. This method closes the interpreter, ending the execution of the script being run. We give it one argument, 1 (or true).

TAKING INPUT

There are two methods of taking input from the user, and the one to choose depends on the kind of data needed. If a string is needed from the user, the raw_input method is used.

This method takes one parameter, which is optional. The parameter is the prompt the user sees when the method is called. Exclude the parameter and you might be confused by seeing a blank line.

The other method of taking input is for when you need to take an integer value from the user that you can work with mathematically.

This is an example of taking both a string value and an integer value.

```
s = raw_input("Centre letter: ")
i = input("Enter an integer: ")
```

METHODS

Methods, or functions, are created with the def keyword. Python methods can take parameters and return values. The code for this project has one method: __init__ . This is a special method known as the initialiser. It's called automatically when an instance of the class we've coded is created. This is generally a good place to create any instance variables the class is going to use, but because this project is small, all the logic is done in the initialiser method.

The line that creates the initialiser looks like this:

```
def __init__(self, filename, centre, all):
```

The def keyword is followed by the methods name. Giving it the name __init__ means Python will call it automatically when an instance is created. If you give it any other name you will have to call the method manually, except for a few other special methods that Python recognises.

Another example of a special method is __str__ , which returns a string representation of objects created with the class.

Our initialiser method takes four parameters. The first, self, represents the instance of the class itself. Passing the object itself around allows to create and access instance variables as well as methods. We don't have to worry about supplying the self parameter, though, as Python takes care of that. The second, filename, represents the path of the dictionary file. The third parameter, centre, holds the character the user supplied as the letter in the centre of the puzzle. The last parameter is a list holding all the characters the user gave, and has the identifier all.

Again, a colon is used to signal the end of the method definition and start the new block of code that makes up the methods body.

OBJECT-ORIENTED FEATURES

The code for this project contains one class, which demonstrates Python's inheritance capabilities, as it inherits from the built-in data type list. Inheriting from this data type means our class has all the characteristics of the list data type.

The class keyword is used to begin the creation of a new class. Then a class name is needed, and in this project it's WordList. If the class is to inherit features from another class, it needs to be placed after the name of the new class in parentheses.

The code to create the WordList class looks like this:

```
class WordList(list):
```

Here, the data type list is supplied in brackets. Any other data type could be used here, such as int or str.

Python supports inheritance (as has just been shown) and encapsulation, allowing you to privatise variables and methods of a class. It doesn't support polymorphism, though.

EVEN MORE

This isn't an extensive guide and you should investigate more, like at the Python homepage (**www.python.org**), which has tutorials and documentation for all the standard distribution modules. EOTP

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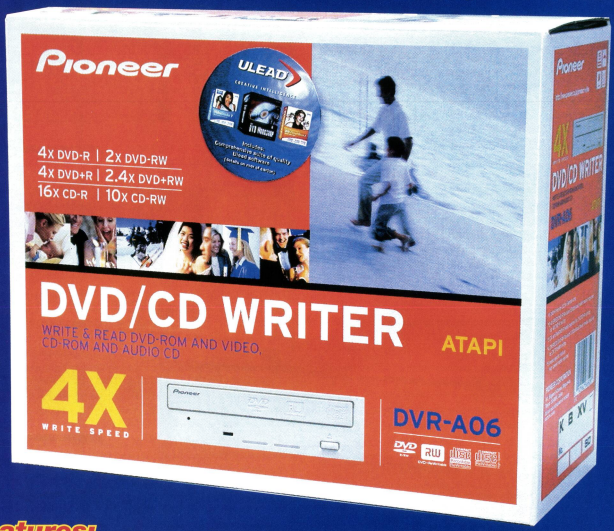
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Host your own RAIDing party

***Matt Overington* shows how to make your PC run faster and safer by setting up a Redundant Array of Inexpensive Disks (RAID).**

You can clamp the beefiest CPU onto the most overclock-friendly motherboard, fill every slot with RAM and strap in a blazing fast video card. But no matter how lightning-fast your system is, hard drives can all too easily become a major bottleneck.

Modern hard disks can write slabs of data in a split second, yet applications are often kept waiting as large files are written or data is juggled between RAM and the disk's virtual memory. That's because the disk head can move only so fast over the platters, and the more heavy-duty apps you run, the more noticeable this becomes. It's especially true of home video and high-end graphics editing, which place a massive load on disk subsystems.

The answer is RAID (Redundant Array of Inexpensive Disks): a server technology which strings together several hard disks and is becoming increasingly popular on the desktop.

RAID arrays can be set up to provide much faster access times than a single disk, or to duplicate data across two disks so you've always got a failsafe to keep working with. Some RAID configurations provide a mixture of both these benefits.

Practically all motherboards include on-board RAID controllers, and those that don't can be supplemented with PCI cards for as little as $100. The largest cost is the hard drives: desktop RAID systems usually employ two drives. And if you want to use RAID to mirror your data for ultra-safe computing, these drives have to be identical, so you'll possibly be up for the cost of *two* new drives.

But now that hard drives pack so much data for so few dollars — bargain hunters can pick up two 80GB units for around $350 — it won't break the bank, especially when weighed up against the cost and hassle of data recovery (or in the worst case, total data loss).

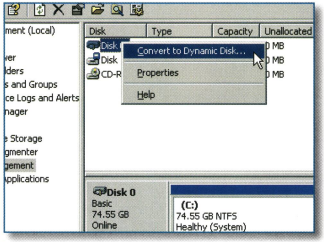
SPEED, SAFETY, OR A BIT OF BOTH?

There are several distinctly different types of RAID, with the most common implementations as follows.

Level 0: the most basic performance-enhancing mode, RAID 0 spreads blocks of data across a pair of disks using "stripping". One data block is sent to the first drive, and while the read head is moving over the platter and writing, a second data block is dispatched to the second drive. As soon as the first drive has finished writing the first block of data, the RAID controller fires another chunk at it.

Alternating data feeds between drives reduces latency and speeds disk operation. It's common in a server environment, where many users access the disks at once, and there's plenty of data being shunted to the CPU.

This makes RAID 0 the best choice for desktop speedsters. However, Level 0 arrays don't provide redundancy or fault tolerance: if one hard disk goes down, you lose the data from both.



Dynamic conversion: *preparation for setting up disks in a RAID array.*

Level 1: this also uses a pair of drives, but stores the same data on each. This "mirroring" implementation means you only see the same storage capacity as you'd get from a single drive, rather than the increased capacity of a RAID 0 array. The upside is that you won't lose any data if one hard disk crashes, because the second drive remains intact. In a perfect world, we'd all be running RAID 1 arrays!

Level 3: less common than 0 and 1, RAID 3 arrays strip data across two drives but employs a third drive for error correction. This gives you something approaching the speed of a RAID 0 solution but with some fault tolerance for peace of mind.

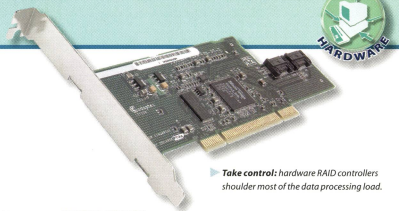
Level 5: this is another striping configuration, but instead of working with blocks of data, it copies data at the byte level, working through the disk one byte at a time. Error correction information is also stored on a third disk to provide fast disk access and a modicum of fault tolerance.

FIRST STEP

Desktop users lean towards RAID 0 for speed or RAID 1 for safety. Whichever array you choose, it's one of the easiest and most beneficial upgrades you'll ever make.

The first step is to ensure your hardware is up to spec. In most cases your motherboard will have an on-board RAID controller and the necessary IDE or serial ATA connectors. If it's not RAID-ready, and you don't plan to upgrade the mobo in the near future, you can always pick up a PCI controller card starting at under $100 (see the box on the opposite page).

One advantage of a dedicated RAID controller is that it frees the CPU from performing much of the data handling, wheras some mobo controllers aren't capable of this calculation shifting, which place a heavier processing load on the CPU. It's something to think about if your CPU is running full-tilt all the time, but it won't cause a problem for most users.



Take control: *hardware RAID controllers shoulder most of the data processing load.*

Then comes a spot of hard drive shopping. For mirroring data between two drives (RAID 1), both RAID disks must be identical in every way, which means you'll probably have to buy two new drives. This is less of an issue for striping, although in RAID 0 both disks must have the same amount of free space and be formatted with the same size clusters.

Even for RAID 0 you might want to pick up two new drives and keep your current one as the system drive, because if one RAID 0 drive fails it'll take the other with it.

Before filling your case with drives, you'll probably have to upgrade the power supply. Anything less than 400W will start to strain under the increased load, and you risk damaging your hardware. Given that a modern motherboard and CPU draw up to 85W, a 250W or 300W PSU doesn't go far in a cutting-edge system.

After connecting all your drives and booting into Windows 2000 or XP, you'll need to set up the RAID array under the OS. Right-click the desktop's My Computer icon and select Manage. In the Management Console, expand the storage tree and click on the Disk Management folder to see a graphical view of all the drives in your system.

The first step is to convert each of the potential RAID drives to "dynamic disks". Get into Disk List mode by clicking View in the toolbar, then Top > Disk List.

From here you can right-click any disk in the top pane and select Upgrade to Dynamic Disk. The process is completed in a few seconds and it doesn't damage any data on the drive.

When that's done, reboot and re-enter the Management Console, and select the Disk Management folder. Now you're ready to follow the seperate steps necessary for either RAID 0 (speed) or RAID 1 (safety).

ZERO HOUR

At this stage, there should be no partitions allocated on your new disks, so right-click in the unallocated space and select Create Volume. In the wizard launched to set up the disks, click Striped Volume under Volume Type before clicking Next.

In the left-hand pane there's a list of all the disks that can be included in the new striped volume. Select the disk you'd like to use with the first and click Add.

If you set up striping with two disks of different sizes, Windows will build a striped drive that's double the capacity of the smaller one. If, for example, one drive has 1GB free and the other 2GB, only 1GB will be used from each disk (leaving 1GB unallocated on one disk).

Click through the wizard until you're asked to assign a drive letter path: click Assign Drive Letter and enter the character you want for the new volume. Click Next after a drive letter (or folder) is set, and then choose "Format this partition with the following settings".

Either FAT32 or NTFS will work as a file system type, and it's wisest to rely on the default allocation size. After the format has been completed, return to the Disk Management console, where the new RAID 0 drive will now be listed as a single volume.

MIRROR, MIRROR

Establishing a mirrored RAID 1 configuration under Windows 2000 or XP is similar to the steps for RAID 0, but even simpler. In the Computer Management console, click the Disk Management tab under Storage. Right-click the partition you want to mirror and select Add Mirror.

After choosing the disk to mirror from, select the disk to mirror to and click Add Mirror. Click Commit Changes Now under the Partition menu and the first disk will begin duplication onto the second.

It's worth noting that if you start with two empty disks, it saves a lot of time.

When the duplication is complete, close the console and reboot. The RAID array will be functional as soon as Windows restarts: now even a fatal hard drive crash won't lose any of your work or bring your system to its knees.

AN UNPERFECT TEN

You can appreciate how easy it is to get RAID 0 and 1 configurations up and running, although these are by no means the limit of what's possible. For instance, users can combine the two most common implementations into a mirroring *and* striping configuration known as RAID 10 or RAID 0/1. This gives you the fastest and most secure desktop disk system available, but it's not without drawbacks.

For most users, RAID 10 is prohibitively expensive, because you need to be running *four* hard disks, yet you only get the capacity of two. Neither Windows 2000 or XP support RAID 10 natively, and the CPU has to take care of all the RAID functions, which has a dramatic impact on processing time. EITTE

It's in the cards

If you're serious about getting the best performance possible from your disk system, consider a hardware RAID option. PCI-based ATA133 hardware RAID controllers starts at under $100 and support RAID 0, RAID 1 and RAID 10. More expensive, server-based cards are also available for SCSI, and more recently, serial ATA disks.

How you choose to configure the card will impact upon the number of drives you have to buy, but the IDE RAID controllers generally can't be used for booting. This forces you to maintain a separate system drive and RAID your data disks.

Setup is fairly straightforward: open your case, find a spare PCI slot and drop the card in. Once the controller is in place, you can connect the disks up to the IDE slots on the spine, and then boot the computer.

A setup disc is supplied with the card to enable you to configure the array, and after a quick format and reboot, you're ready to rock and roll.

Bonus CD software
Apache, MySQL and PHP for Windows, Mac OS and Linux.

Access some areas

Steven Noble **explains how to add a members-only area to a Web site using PHP, MySQL and Apache.**

You can easily build a members-only area into your site that allows selected users access to protected files. The key lies in MySQL (**www.mysql.com**) and PHP 4.2 or later (**www.php.net**) — two free technologies that are available for numerous operating systems and work with the Apache Web server.

MySQL provides the database for storing each username and password, Apache drives the Web site and PHP is the glue that holds it all together — comparing the password with the database.

ROLL CALL

The first step is to create a database in MySQL that will store each member's username and password.

Access your OSes command line and launch MySQL. Then type the following commands at the MySQL prompt:

```
CREATE DATABASE membersarea;
use membersarea;
```

This creates a database called membersarea and tells MySQL that the following commands relate to this database. To create a table in this database for storing usernames and passwords, type:

```
CREATE TABLE members (
ID INT NOT NULL AUTO_INCREMENT PRIMARY KEY,
username varchar(32) NOT NULL,
password varchar(32) NOT NULL);
```

This creates a table called members with three columns: ID, username and password. None of these columns will accept fields that are empty, or null.

MySQL — not the database administrator or the Web site visitor — will set the value of ID for each member, incrementing this number automatically. This ensures that each member's ID is unique and can be used as the primary key — that is, a column in this table that MySQL can cross-reference against primary keys in other tables, such as a table that records each member's preferences.

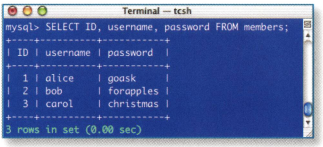
Each of the other two columns in this table can store text strings (varchar) of up to 32 characters.

Now insert three usernames and passwords into the table. Type:

```
INSERT INTO members SET username = "alice", password = "goask";
INSERT INTO members SET username = "bob", password = "forapples";
INSERT INTO members SET username = "carol", password = "christmas";
```

To see these three members, type:

```
SELECT ID, username, password FROM members;
```



You show me yours: *type* SELECT ID, username, password FROM members; *to view this table from the database.*

These instructions are also in the members.sql file in the 1st_step directory on this month's cover CD set.

IN THROUGH THE IN DOOR

The second step is to create a login form. In a text editor, create a minimal HTML file using the standard <html>, <head>, <body> and <title> tags. In the body area of this file, add the following:

```
<p>Please login to view members-only content.</p>
<form method="post" action="test.php">
<p>Username:</p>
<input type="text" name="username" size="30" maxlength="30">
<p>Password:</p>
<input type="password" name="password" size="30" maxlength="30">
<p>Use letters or numbers only.</p>
<p>Maximum length: 30 characters.</p>
<input type="submit" value="Enter">
</form>
```

When the visitor clicks the Enter button, this form will send the values that they entered into the Username and Password fields to the script nominated in the form's action attribute, test.php, which doesn't exist yet. Setting the type attribute of the second field to "password" tells the Web browser to not show the password onscreen when the user enters it into the form. This is a barrier to "shoulder surfing" — using surreptitious glances to steal someone's password.

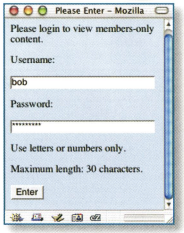
Save this file as enter.php, or grab it from the 2nd_step directory on the cover CD, and open it in a Web browser.

A SIMPLE START

The third step is to create a "proof of concept" PHP script that accepts usernames and passwords from the form and checks them against those stored in the database.

This script should be designed with security features, error-trapping abilities and greater abstraction than shown here, but in this Workshop we're just focusing on how to provide the main sign-in functions.

Cold shoulder: *setting the type attribute of the second field to password tells the Web browser to obscure the password on screen.*



To begin, create a new text file. Between the familiar <?php and ?> tags, type:

```
$username = $_POST['username'];
$password = $_POST['password'];
```

PHP automatically assigns the form's data to the array called $_POST. The code shown above copies this data from the array to the variables $username and $password.

Next, type this code to establish a connection to the database table that stores the usernames and passwords:

```
$connection = @mysql_connect(localhost, mysqluser, mysqlpass);
$db = @mysql_select_db(membersarea, $connection);
```

The first line connects to the MySQL database server while the second connects to the appropriate database. Use a real MySQL username and password instead of mysqluser and mysqlpass.

Next, type these five lines to grab any record from the database that matches the username that the visitor punched into the form:

```
$sql = "SELECT * FROM members WHERE username = '$username'";
$result = mysql_query ($sql);
$row = mysql_fetch_array($result);
$usercheck = $row['username'];
$passcheck = $row['password'];
```

The first line defines a query that will select every field (*) from any record in the table called members that matches the username provided by the visitor. The second line executes the query. The third puts the result — the username, password and ID from the matching record — in an array. The last two lines grab the username and password from the array and hand them to $usercheck and $passcheck.

Finally, the script must compare the visitor's credentials with those in the database, and accept or reject the access request accordingly. To achieve this, type:

```
if ($passcheck == $password and $usercheck == $username):
echo("Come in."); else:
echo ("Get lost."); endif;
```

To test the script, create a directory called membersite in Apache's document root and place enter.php and test.php there. Now, point a Web browser at **http://127.0.0.1/membersite/enter.php** to view the sign in page. Try entering with bob and forapples. The script should ask you to "come in". Now try bob and isyouruncle. The script will tell you to "get lost".

Now to execute a simple hack — return to the access page, leave the Username and Password fields blank, and then click Enter. The Web site will welcome you in. Why? The script searched the database for all records where the username was empty, and the result was empty. It then compared nothing with nothing, found they matched perfectly, and politely let you in.

Luckily, the solution is simple. Add this clause to the if() function in test.php:

```
and $username != ''
```

This checks that the username isn't blank. Try it, or grab enter.php and join.php from the 3rd_step directory on the cover CD set.

SPREAD THE LOVE

This script is fine for guarding one page, but it's time to create a system that will guard every members-only page on a Web site. Once a user signs in, the script must remember they are signed in for an entire session.

Create a new text file. Between the familiar <?php and ?> tags, type:

```
session_start();
```

This tells PHP that it must either begin a user access session or continue with the session it's already begun. This command must be higher on the page than anything displayed in the Web browser window.

Beneath session_start(), type:

```
if(!isset($_SESSION["authenticated"]) or $_SESSION["authenticated"] !=
"yes"):
```

The if() structure means "if this condition is met, then do this that". In this case, the condition has two parts, separated by an or operator. The first part resolves to "true" if a variable called "authenticated" hasn't been added (!isset) to the $_SESSION array, which stores variables that the PHP script will pass from page to page during a user access session. The second part of the condition resolves to true if the variable is in the array, but its value is not (!=) yes. If either part resolves to true, the condition is true (because of the or statement), and PHP will execute the rest of the if() statement, which should read:

```
header("Location: http://".$_SERVER['HTTP_HOST'].dirname($_
SERVER['PHP_SELF']).'/enter.php");
endif;
```

The endif; operator ends the if() statement so the header() is the only command that PHP will execute if the condition is true. The header() command will send a "Location:" HTTP header to the Web

browser, escorting it to a new Web page. The code that's within the header() command constructs the address of the destination page from four components, joined by periods (.). The meanings of the first and last components, http:// and /enter.php, are self evident. The second components is the IP address of the Web server, grabbed from the $_SERVER array. The third takes the complete path to the current file and pares it back to just the directory name — this will be /membersite if all files are in a directory called membersite at the root level of Apache's document directory. The net effect is to build a complete URL that points to a file called enter.php in the same directory as this file. Building the address dynamically rather than typing it in full ensures the code will be fully portable.

Save this file as screening.php in the same directory as enter.php. Create some members-only Web pages and save them to the same directory. include() this file in every members only page by starting each of them with this line of code:

```
<?php include(screening.php); ?>
```

Try pointing a Web browser at a members-only Web page. It will recognise that the visitor isn't signed in, and transport them to enter.php. To test the sample files in the 5th_step directory on the CDs, point a Web browser at **http://127.0.0.1/membersite/content1.php**.

IN AND UNDER

A complete access-control script should do more than simply ask the visitor to "Come in". It should automatically take them to the content they asked to view in the first place.

The first step is to record the name of the file the visitor was hoping to view. Every members-only page includes screening.php, so that file is the perfect place to add this code. After session_start() and before the header() command, type:

```
$_SESSION['sourcepage'] = basename($_SERVER['PHP_SELF']);
```

This line of code extracts the filename from the current page's complete URL (the content1.php from **http://127.0.0.1/membersite/content1.php**, for example) and records that filename in a variable called $sourcepage, stored in the $_SESSION array.

In test.php, replace echo("Come in."); with:

```
$_SESSION['authenticated'] = 'yes';
header("Location: http://".$_SERVER['HTTP_HOST'].dirname($_
SERVER['PHP_SELF']).'/'. $_SESSION['sourcepage']);
```

The second line redirects the Web browser to the page of members-only content that they asked to view in the first place, using the techniques discussed earlier. The first line sets $authenticated to 'yes' and stores this variable in the $_SESSION array — so screening.php will find it there and know to let the visitor view the members-only page.

All these files are in the 6th_step directory on the CD.

The code for the logout page, logout.php, is quite simple:

```
session_start();
$_SESSION = array();
session_destroy();
header("Location: http://".$_SERVER['HTTP_HOST'].dirname($_
SERVER['PHP_SELF']).'/index.html');
```

The first line finds the active session. The second copies an empty array into the $_SESSION array. The third destroys the session. The fourth redirects the visitor to the Web site's home page, index.html.

This page, index.html, is a simple file that points to the three members-only content pages: content1.php, content2.php and content3.php.

The following PHP in index.html will display a link to the logout page whenever the user is logged in:

```
if ($_SESSION["authenticated"] == "yes"):
echo ("<p><a href=\"logout.php\">logout</a></p><hr>");
endif;
```

Remember to check that Apache is configured to process HTML files with PHP. Also remember to whack a <?php session_start(); ?> at the top of index.html so the $_SESSION array will be known to it.

Add a link to the index to content1.php, content2.php and content3.php along with the conditional link to logout.php. There's no need to add session_start() to the top of these files, as it's already there courtesy of include(screening.php).

As a final courtesy, the script needn't tell visitors to "get lost" if they provide the wrong username or password. It should return them to the sign-in page and ask them to try again. In test.php, delete echo ("Get lost."); and type:

```
$_SESSION['error'] = 'yes';
header("Location: http://".$_SERVER['HTTP_HOST']."/membersite/
enter.php");
```

This code records that the user made an error and sends them back to the sign in page.

In enter.php, replace Please login… content. with the following block of PHP:

```
<?php if ($_SESSION["error"] == "yes"):
echo ("<p>Sorry, wrong username and/or password.</p>");
echo ("<p>Please try again.</p>"); else:
echo ("<p>Please login to view members only content.</p>");
endif; ?>
```

This will display one message for first-time entrants and another for visitors who mistyped their passwords. Remember to add <?php session_start() ?> to the top of this page so the $_SESSION array is available.

You now have a complete system for protecting members-only content. Save the lot to the same directory or grab it from the 7th_final_step directory on the cover CD. Point your Web browser at **http://127.0.0.1/membersite/index.html** and take it for a spin. LXF

Protect the password

At present, this site stores your MySQL username and password in test.php. If PHP fails, Apache won't execute the username and password — it will simply hand them to whoever visits the site, which is a huge security vulnerability. The solution is to whack them in an include() *file stored in PHP's include directory — outside Apache's document directory. To find PHP's include directory, run the info.php script that's in the security_tricks directory on the cover CD.*

Bonus CD software
Drive Image 5 full version, plus a trial version of Drive Image 7.

Up and running with **Drive Image 5**

***Matt Overington* shows how to safeguard your system using our free cover CD set software.**

We're thrilled to offer readers a full version of Drive Image 5 on this month's cover CD set. It's a powerful, versatile utility and is a favourite of the *APC* team.

We use this software in our labs to create, store and quickly apply hard disk images when benchmarking PCs, plus several staff members back up their home systems by taking a Drive Image "snapshot" of the hard disk or data partiton.

These are real-world examples of the two main uses for Drive Image: applying an image to replicate a standard system (for quickly setting up several identical PCs, such as rolling out a network), and taking a drive snapshot to quickly restore a PC in the event of a crash.

This workshop is a quick walkthrough, but we *highly* recommend that you print and read the PDF manual on our cover CD so you can fully exploit this outstanding software.

INSTALLATION

Drive Image 5 works on Windows 9x and Me, and with some caveats, Windows 2000 and XP. Those qualifiers are the service packs: version 5 is not guaranteed to run under Service Pack 1 of Windows XP, or under SP3 or the just-released SP4 of Windows 2000. However, the factory-fresh XP and SP1 and SP2 versions of Windows 2000 should pose no problem (with all cover CD software, neither *APC* nor PowerQuest can offer technical support). Drives bigger than 80GB aren't supported in Drive Image 5.

This software's setup wizard requires an activation key, available online by clicking the link in the installer.

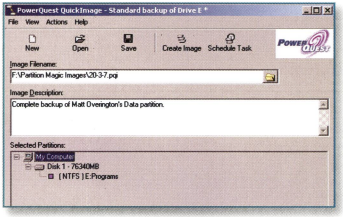
You also should have some blank floppy disks handy so it can use them to create boot disks to help in system restoration. Note that Drive Image 5's DataKeeper feature — which automatically makes secure backups of mission-critical files — doesn't support Windows XP, so XP users should disable it

The core of Drive Image 5 runs from DOS, so when launching the utility you'll be prompted to close all programs and reboot the PC. Several components can, however, be run from Windows. This includes the QuickImage tool, which schedules regular backups, and ImageExplorer, which lets you view the contents of an image, copy images or partitions, and extract files. It's also useful for adding descriptions to image files and partitions.

ON GUARD

The first step in safeguarding against PC meltdown is to use Drive Image to create an image of your hard drive, and the best tool for this is QuickImage. This utility creates a script that's automatically run by Drive Image's DOS component after a reboot.

Choose where to store the backup image file; if you're backing up to a hard disk, click the folder icon on the right of the text field and select the appropriate location.



Simple and safe: *backing up doesn't get much easier or smarter than this.*

For writing the image file to a CD, you'll need to enter the drive letter and a name for the backup file in the Image Filename field (such as E:\MYBACKUP.PQI), because Drive Image 5 won't browse to CD-RW drives. Don't worry if the image is larger than a single CD, because Drive Image will split the file into 670MB segments to span as many CDs as needed.

Now return to the main QuickImage screen, type a description and click the Select Partitions tab to open the disk browser. Select the partitions to back up (use Ctrl+click to select more than one), and click OK to return to the main screen.

If you want to repeat this backup routine in the future, perhaps on a weekly basis (and you'd be mad not to), click Save at the top of the QuickImage screen so the backup profile can be loaded into QuickImage next time. You can also use the Schedule Task icon in the shortcut bar to automatically create fresh backup images.

Click Create Image to launch the main Drive Image application. The machine will reboot to DOS, create an image of the drive and stow it out of harm's way.

BACK TO LIFE

If your PC crashes one dim dark day, don't panic: just feed those boot disks into the PC's floppy drive and restart the computer. The first disk loads a basic OS and some drivers; the second runs Drive Image. Click Restore Image to browse for the backup image.

If it's on a CD, the CD-ROM drive will be listed as \\.\pqcdx (where x is the drive letter). Select the PQI image file, then click Select Destination Drive to choose the partition or unallocated space to which the image should be restored (this step is omitted if your PC has only one drive).

Click Finish on the next screen to overwrite an existing partition (if you've selected one containing data) and select the write mode. We suggest the safe mode option. Although it takes longer to restore the partition, each byte of data is verified along the way.

Bonus CD software
A collection of sample movies and project files for Blender.

Turning tables with **Blender**

With the opening of the source code to NaN's Blender, 3D modelling isn't restricted to those with design and maths PhDs, writes *Ashley Harris*.

Many readers will be familiar with Blender, NaN's free 3D modelling suite. While novice users bemoan its daunting interface, older hands think of it as intuitive.

The fact is, Blender — reviewed in *APC* July, page 60 — is one of the most powerful free 3D applications around, going far beyond the limited features of raytracing applications. The interface does hide practically everything though. But that aside, I'm still finding new features years after first dabbling in 3D.

BE PREPARED

Before getting started, the application must be stored on your hard disk. It's available for Windows, Mac OS X, Linux and other nix flavours, and we've included the Linux and Windows versions on this month's cover CD set. At only about 3MB, it can be downloaded from the Web if preferred.

On firing up the software, you're launched directly into the edit window. This is a serious 3D application and there are no tutorials or guides for beginners. The bottom third of the screen is filled with buttons and the rest with a grid, a pink square, crosshairs and a triangle.

This is where most newcomers retreat to more familiar applications. But don't panic.

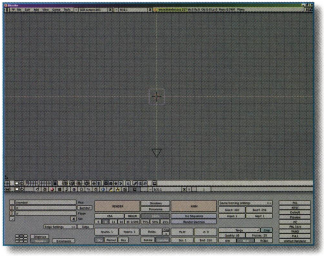
Prior to getting stuck in, it's wise to learn the basics of manipulating your designs. Hold down Alt, and click and drag on the grid. It should rotate the axes and shift your reference point. Alt+Shift+Drag moves you left/right/up/down, and Alt+Ctrl+Drag zooms in and out.

An alternative is the numeric keypad: 1, 7, 3, Ctrl+1, Ctrl+3 and Ctrl+7 put your view in presaved (top, left, front, etc); pressing 2, 4, 6 or 8 rotates the camera; Ctrl+2, Ctrl+4, Ctrl+6 and Ctrl+8 move the camera; and + and - control the zoom. Pressing 5 changes the to/from perspective mode.

This can be handy for some functions, but generally it's a difficult place for drawing objects.

The next step

You can create much more than tables and glasses with Blender. Go to *www.blender.org* or *www.digitalblasphemy.com* for examples. We've included the Div-X 5.05 version of Eddy Moussa's masterpiece "Out of Memory" on this month's cover CD set. You can also visit *www.blender3d.org*, *www.elysuin.com* or *http://members.yourlink.net/gruff* for further tutorials and references.



Where are you? *every command is hidden within Blender's interface, making it difficult for beginners.*

SIMPLE DRAWING

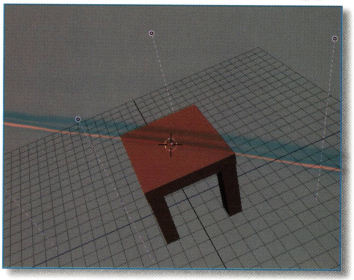
Another helpful key combination when learning is Ctrl+X. This returns the whole app to its initial settings and resets the 3D "world". Most will expect Ctrl+X to cut a line or object from a design, but there are no copy, cut, paste or undo functions in Blender. The only lamentable exclusion is undo, but you learn to work around that.

After familiarising yourself with how to manipulate the 3D world, it's time to start dabbling with drawing. There's no point in starting off with a complicated design, so pick a simple object. The 3D modellers' equivalent of the Hello World program or script is a square dining table.

Start by drawing a basic 2 x 2 unit square on the screen. Press 5 to adjust the scale and move the mouse until the square is about 6 x 6 units. Now click to confirm your change. You can cancel at any time by hitting the Esc key.

So far the square is only 2D and needs depth. To add this, you actually edit the shape. Hit the Tab key to enter edit mode, and notice the square change to four lines between four points. The points can be selected individually with the right mouse button, then move them by pressing G (to grab). Once again, clicking confirms the change and the Esc key cancels it.

More than one point can be selected by holding down Shift while right-clicking. Select them all and press Numpad+1 to get a view from the front. Hit the E key to extrude the shape, and confirm the dialogue box. This pulls a copy of a shape away from the original — in this case the box — and links the two with the appropriate edges and faces. Move the new copy down one grid unit and confirm by clicking the mouse.



Hello world: *draw a simple object like a table to familiarise yourself with the program.*

Press Tab to leave edit mode, which also serves to confirm the edit, and use Alt+click to view your creation.

LEG SHOW

A box is hardly a table. Time to add legs. Make sure you're out of edit mode and press 7 on the numeric keypad for a view from the top. Click in the middle of the top right grid square of the table to move the crosshairs there. Press 1 on the pad for a front-on view and the crosshairs will be in the top-right corner of the box. Click on the bottom side of the box just below the crosshairs.

Switch back to the top view and press Shift+A (to add). A menu will pop up with options, and you want to add a plane (square). Select Add, Meshes, Plane. When you add it, press S and shrink it until it's about one grid unit wide. Now press 1 on the pad and extrude it the same as the tabletop. Drag it out to about four units high. Admire your handiwork using Alt+drag.

Leave edit mode and press 7 to display the top view. Very few tables stand up with only one corner-mounted leg, so you'll need to add more. Press Shift+D (duplicate) and position the new legs with the mouse, finally clicking to confirm the changes (again, Esc cancels). Repeat until the table has four legs.

You now have five separate objects making up a single table, which is hardly efficient. Select all five using Shift+right click (don't use the A shortcut, which selects everything in the "world"). Press Crtl+J to join the selected meshes. With the single discrete table selected, press Z to colour it in (the default is shades of grey).

MATERIAL OPTIONS

Why not give your new furniture a wooden look? Click on the red sphere on the toolbar, which has a ToolTip of Material Buttons. This brings up the material options, but it's empty. You need to create a material first.

To the right of the Material Options button is a lone button that looks like a hyphen (with the ToolTip Browse Datablock). Press and hold it down and choose Add New. About 100 buttons and sliders will appear. Choose a wood-like tone on the RGB sliders (second column) and the table will be coloured in.

It won't look like wood yet because you need to add a texture. On the right side you'll see a small button all by itself labelled "-". Click and hold and a menu will appear. Choose Add New and a few buttons will appear. Move to Texture Options, one button to the right of the Material Options icon.

For a wooden texture, pick the appropriate button from the top line and click. A new row appears below it where you can adjust either Ring Noise or Band Noise. To change the noise values, click on the button and drag left (smaller) or right (larger).

Feel free to experiment with textures and grains. When you create something that resembles wood, go back to Material Options. Your wood colour should be overlayed with an artificial-looking purple texture. Change the purple to a wood tone using the RGB sliders (bottom right).

SEEING THE LIGHT

After finishing the changes, have a look at the wood texture on the table by pressing Ctrl+Z to enter textured preview mode. Note that the table's black, because you haven't added a light source.

Press Z twice to get back to the solid view. Go to a front or side view and click a good distance above the table. Press Shift+A to add an element, and select Lamp from the Add menu. A circle with a dotted line running down to the table should appear. Commonly known as a point light, it's the 3D equivalent of a lightbulb.

Press Ctrl+Z to see your table in its textured glory. Duplicate the light by pressing Shift+D and dragging to a new location.

The one object still unused in the 3D world looks a bit like a camera. This is no coincidence. Press 0 on the numeric keypad to look through the virtual camera's viewfinder, although it will probably be too low to get a useful view of the table. You can select this object with the right mouse button and move it with the G key.

Remember that the 1, 3 and 7 keys on the keypad can be used to switch views. As much of the tabletop as possible should be within the outer dotted line.

After you've drawn your table, textured it and positioned the lights and camera, hit F12 to see your table in a pop-up window.

SPECULARITY VALUE

Unless you're brilliant or very lucky, you'll probably have the colour or texture contrasting too much with the main colour. Adjust the RGB values until it looks realistic.

The table may also be too reflective, bouncing too much light into the camera. Fix this with the Spec (spectularity) setting in the left-hand column of Material Options. It should be at about .100 for a satin finish and .500 for thick gloss.

If you're happy with your changes, hit F10 to enter display options and find the file type pop-up menu. The default file type is Targa but you may prefer to choose JPEG or PNG. Change the Pics field to a location on your hard disk. Change the End



Get creative: *Blender can be used to generate far more complex designs than merely tables and glasses.*

field to 1 and click the big red ANIM button to save the file to your drive.

For minor tweaking, select the table and points to modify, and move them with G. You might also want to move the whole table up so the legs are on the bottom of the grid. Go to the front view, select the table, press G, move the table up and click. To rotate the camera for a better view, hit 3 to enter the side view and R to move the viewpoint.

TURNING TO WINE

After you've mastered some tables, chairs, basic houses and other solid objects, the next challenge is a wine glass. Design and construction is slightly trickier, but Blender simplifies the process. With a little practice, a wine glass can be thrown together in less than 30 seconds.

Press Ctrl+X to start afresh and go into edit mode. Select every point and delete all the vertices by pressing X or Delete and choosing Vertices from the menu. Move to the side view (3 on the keypad) and Ctrl+click half the outline of a glass, with the centre axis as the middle of it.

Don't worry too much about constructing the curves of the glass as they will be filled in later. Your glass should rely on around 8-10 points, and should look pretty rough.

Once you've drawn the basic outline, it's wise to let Blender tidy it up. Leave edit mode by pressing Tab and hit F9 to enter the edit buttons screen. Click the blue/green Subsurf button in the second column and change the Subdiv option below it to 3, 3.

The glass will already look better. It's important to realise that this hasn't changed the lines drawn; it has generated an effect on the lines.

You can enter edit mode and still work with the original lines if subtle changes are required. When the glass is perfect, Blender can create a new object that looks like this glass but without the need for the subsurf effect. Press Alt+C while not in edit mode and select "convert the subsurf to a mesh (keep original)", then hit X to erase the original glass.

This technique can be used to create all manner of curved surfaces and is especially useful for car models.

GLASS TEXTURE

The next step is to map a glass texture to the object. Hit Tab to return to edit mode, and select everything by pressing A. Enter the top view by pressing 7 on the keypad. Press F9 to switch to the edit buttons screen, find the Spin button in the fourth column and note the settings below. Change Degrees to 360 and Steps to 16, and leave Turns as 1. Hit Spin. Using Alt+drag, view the new effect. Press Z to preview it coloured in — it will probably look blocky. To fix this, press Set Smooth under the edit buttons screen.

Next, set a material. Head to Material Options and create new material by clicking on the hyphen in the toolbar. Adjust the channels to make it light blue and turn the Alpha value down to about .5. The Alpha setting is directly below the RGB sliders. Also find the ZTransp option in the third column and toggle it.

Don't forget to move the camera and add a light before hitting F12 to render the object.

MOVING AND SHAKING.

Blender's rendered static images are impressive, but it's capable of a lot more. It can generate animations to a professional level with a little skill and patience.

Blender uses a keyframing method to animate objects. You tell it where an object is at two points in time, and it works automatically. It can animate the position, rotation, size and visibility of any object in addition to its colour, transparency and texture. With practice, the list of effects is endless.

By default, all images in Blender are frames of an animation. Navigate through them using the arrow keys. Initially, this won't show any changes, as you haven't created an animation, but you'll notice the frame counter in the right-hand side of the toolbar changing.

For a first, simple animation, make sure the camera is lined up with the glass. Go to the top view (7 on the pad). Return to frame 1 of the animation by holding down the down arrow and select the camera with a right-click. Press I to insert a keyframe and choose LocRot (Location and Rotation).

Use the arrow keys to skip ahead to frame 150. Move the camera to a new position using G and rotate it to face the glass using R. Press I again to save the data to frame 150. Jump to frame 300 using the arrow keys and move the camera to a new position. Rotate the glass to face the camera and insert another keyframe by hitting I.

Now press F10 to take you to the render settings and change the End value from its default of 250 to 300. Press 0 on the keypad for a camera view and Alt+A to preview the animation.

Change the render format (next to the green Crop button on the right) to AVI Codec and choose your favourite video codec — DivX is recommended. Click on ANIM to start the render.

It will take some time to output the video and it averages about five frames per second on a mid-range Pentium III machine.

Bonus CD software
Zip archive with relevant files.

ON THIS MONTH'S APC COVER CD

PROGRAMMING

Get XML smart

***Stephen Withers* creates personalised XML Smart Tags that link Office XP documents to Web-based resources.**

Smart Tags are one of Microsoft Office XP's most under-used features, perhaps because relatively few practical tags are supplied out-of-the-box or online. But with a little XML coding you can easily create your own. Here's what you need to know.

DATA IDENTIFICATION

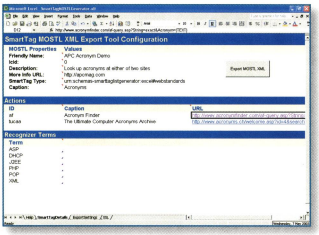
A Smart Tag identifies particular types of data, such as names, flight numbers or people you've recently emailed. When any matching data format appears in Word or Excel, it's flagged with a purple dotted underline. Mousing over this item reveals a menu that indicates the type of data recognised and what actions the Smart Tag can perform; such as inserting flight details into the document.

It isn't easy to create a Smart Tag that recognises data programmatically, whether by performing a database lookup or by recognising a particular format (such as identifying two capital letters followed by three digits (eg, QF001) as a flight number).

Fortunately, there's a simpler form of tag that most people can create themselves. An XML Smart Tag lets you specify lists of items to be recognised, along with one or more URLs the recognised items are to be linked to.

For example, a manufacturer can build a list of product numbers and link to intranet pages that show prices, stock levels or application notes for those products.

But we'll get started with an even easier example: an XML Smart Tag that recognises common technology acronyms and looks them up at The Ultimate Computer Acronyms Archive (**www.acronyms.ch**).

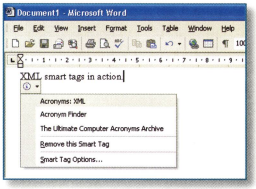


Keeping it simple: *SmartTagMOSTLGenerator.*

PLAYING TAG

The first task is to build the list of acronyms the tag will identify: we'll use ASP, DHCP, J2EE, PHP, POP and XML.

Next, determine the exact URL needed for the online lookup. The easiest method is to perform a manual search on the site, then copy the URL straight from the browser's address bar.



Tag, you're it: *the acronym tag at work in Word 2002.*

For instance, if you search for PHP at The Ultimate Computer Acronyms Archive, you'll see the URL is **www.acronyms.ch/welcome.asp?id=4&searchType=10&wholeWord=0&search=PHP**. If the search string isn't visible in the browser's address bar, you'll need to examine the HTML code on the source page and work out how to form the search URL.

Either way, there's a chance that your search term won't appear at the end of the URL. If that's the case, change the order of the ampersand-separated parameters that follow the question mark. If moving the search term to the end stops the search from working, you're out of luck: one of XML Smart Tag's limitations is that recognised terms can only be added to the URL as the final item.

The easiest way to turn the information you've collected into an XML Smart Tag is to use Chris Kunicki's SmartTagMOSTLGenerator, which is an Excel spreadsheet.

Most of the fields in the spreadsheet are self-explanatory. Change the lcid (locale ID) field to 0 to make your tag language-independent, and when you insert the search URLs, replace whatever string you manually searched for with {TEXT}, and the Smart Tag will automatically substitute the identified text from Office XP documents.

When you've entered the Actions (search URLs) and Recognizer Terms (list of acronyms), click the button labelled Export MOSTL XML. The worksheet will generate an XML Smart Tag file in C:\Program Files\Common Files\Microsoft Shared\Smart Tag\Lists.

To test the tag, open Word and type in a few acronyms from the list — they should be highlighted. If not, got to Word's AutoCorrect dialog and make sure that Smart Tag lists is enabled. You don't need to go back to SmartTagMOSTLGenerator Excel spreadsheet to make changes to the list of acronyms, just use Notepad to modify the XML file directly.

XML Smart Tags also allow for automatic downloading of new versions, a feature you should investigate before deploying your tag for production purposes.

Bonus CD software
Absolute Style
HTML tutorial

Code cutting using CSS

Cut down on code and create professional positioning and graphic effects with Cascading Style Sheets (CSS). *James Bannan* demonstrates.

When controlling text and uniformity of design across Web sites, Cascading Style Sheets(CSS) can be your best friend. The ability to make site-wide changes by editing one source file improves ease of use, development and administration.

However, using CSS for text control barely touches on its real power and capability. The specifications for style sheet syntax and variables (CSS1 and CSS2) allow Web designers to exercise complete control over almost any element that can be placed on a Web page, from tables to images, text holders, navigational areas or Flash movies.

The following examples are all part of a sample Web site you'll find on this month's cover CD set. To get started, launch index.htm. All the CSS code is contained within style.css, and each of the content options in the index follow the subheadings in the article. To view the code of the individual page, right-click anywhere within the page and select View Source from the drop-down menu. You can also follow the comments we've made in the actual CSS files.



Redmond endorsement: *many sites, including Microsoft's, rely on CSS to define their formatting.*

SIZE AND POSITIONING

1. **HTML cells:** Say you want to put a text box onto your Web page, 100 pixels in from the left, 100 pixels from the top, 300 x 300 pixels in size with a red background. One method of achieving this visual effect is by utilising HTML tables and cells (as shown on index.htm). This creates the image of an element moved out from the side and top of the page, but it actually relies on the white space created by the other cells in the table to create the illusion. It also means that the red cell can't move dynamically and requires direct editing of the table code to change its properties. Additionally, the cell occupies "flat space" — it interacts with other elements on the page and by resizing it you could interfere with their positions on the page.

2. **Embedded CSS:** Using a DIV element defined with CSS is a more efficient way to achieve the same effect — where the DIV has top, left, width, height and background-color properties attached to it. You can modify this element by altering the values of the CSS properties, as it doesn't depend on any other elements to achieve the visual effect. Elements like text or images can be placed within DIV tags, making them an ideal container for information.

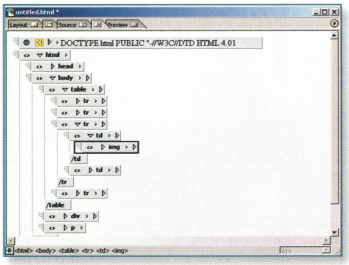
3. **External CSS:** The code from the example above can be split between the main HTML file and an external CSS file — the CSS ID square is defined externally and called into the HTML code using the DIV ID property.

   This method cuts down on unnecessary, and potentially confusing, HTML code. This is because it offloads most of the defining parameters to an external file that can be accessed by any other file within your site's structure. Another advantage is that it makes your HTML files easier to read, navigate and set out. The only required code for layout and most graphical elements are calls to the CSS file, such as IDs, class names, and so on. It produces HTML files with uncluttered code — a definite advantage for developers who prefer working directly with the code.

   You can also control and define element layout and positioning with this method. As you can see from the structure on the sample page, style.css controls every aspect of every element within each of the pages defined with CSS. This centralises control and makes modifications much easier, which is the primary advantage of CSS.

4. **Creating Centred Layers:** Web content that remains centred, regardless of how you resize the browser window, gives a professional feel to your Web site. It's easy to implement this by using percentage values with the width property, and by making use of the float property.

   Percentage values for width reference the size of the browser window; this provides direct accessibility to the window dimension from the HTML code without the need for complex code calls made through a scripting language. float allows you to position elements side-by-side, and their positions relative to each other will remain, regardless of how the browser window is resized.



All style: *WYSIWYG site editor Adobe GoLive 6.0 is capable of producing CSS.*

You can do this by creating three DIV elements, adding float:left; values to their CSS properties, and making the centre layer take up the bulk of the horizontal space with the two side DIVs acting as buffers. These three DIVs need to be contained within one DIV acting as the main container, which takes up 100% of the width of the HTML document. The other three DIVs take up 100% of the width of their parent container, not the document itself.

If you resize the browser window, the centre layer will always stay centred and resize dynamically.

VISUAL EFFECTS

We already know CSS can create visual effects like background colours, but it can also be used for vast array of graphical effects and styles including: borders, border effects, background effects, transparency, scrollbars and layer stacking.

1. **Borders and Border Effects:** An element's border properties can easily be defined through CSS, either the border as a whole, or each individual side. border-color, border-style and border-width define the entire border, while border and border-top (or right, left and bottom) define all aspects of style, width and colour for the entire border or separate sides. The sample page shows two DIVs using a variety of these effects.

2. **Background Effects and Transparency:** The ability of CSS to handle background colours can be extended through the use of filters — these are DHTML values that effect the visual properties of a given element. Filters are handled by the browser and, if you use them in an HTML editor, you won't see the result until you preview your page.

   Transparency is achieved by using the Alpha filter, while background effects like gradients are achieved by using the Alpha filter with start and end points. The examples on the index.htm page show two different types of alpha effects (the blue to red is achieved by placing a red DIV underneath the blue DIV), and the lower two DIVs show the same background colour (the DIV on the right has the transparency effect applied to it).

   When using the Alpha filter, it will apply to *all* aspects of the DIV it's being applied to. If you create a DIV with a coloured background and border, and then apply the filter, it will change the alpha of the border as well as the background.

3. **Scrollbars and Layer Stacking:** As a browser element, scrollbars can also be controlled through CSS. scrollbar-face-color, or -arrow-, -track-, -shadow-, -highlight-, -3dlight- and -darkshadow- properties can all be altered to produce various effects. As scrollbar properties apply to the entire document, they are used in the BODY property within the CSS file. However, in this example we've placed the CSS within the HEAD of the HTML document. This is because we only wanted to apply it to the sample page, if it was in the CSS file it would apply to each document that references the file. The container DIV isn't needed to change the value of the scrollbars, but its large height value forces the scrollbars to appear.

   On the sample page's radial background fade, the z-index property was used. By default, all elements have a z-value of 1, which means that they lie "flat" on the HTML page. Using the z-index property allows two elements to occupy the same top and left space on the HTML page, but different vertical space, determined by the value of their z-index. The higher the value, the higher the positioning, and the closer it appears when viewed through the browser. This is demonstrated on the sample page, where three DIVs overlap top and left, but appear stacked.

   CSS can assist you in creating simple, elegant sites with centralised text and layout controls, a minimum of code and fewer external files required for create graphic effects.

As CSS is soft-coded, it's generally much faster to download than static files, and it assists in creating dynamic content that renders within the browser. Most browsers from the IE 5.0 standard and later will render complex CSS, while IE 5.5 and later will handle all aspects, including filters and transitions.

But wait, there's more . . .

There are plenty of great sites to help you locate CSS values and properties, and demonstrate their use. Try these:

ZVON
www.zvon.org

THE FIXOR LINKS PAGE
www.Web-building.com/css.php3

W3C CSS RESOURCE
www.w3.org/Style

ERIC MEYER
(author of Cascading Style Sheets: the Definitive Guide*)*
www.meyerWeb.com/eric/css

WEBMONKEY CSS
http://hotwired.lycos.com/Webmonkey/authoring/stylesheets

Bonus CD software
A collection of sample files, style libraries and trial software for Photoshop.

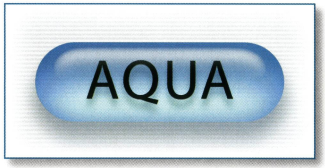
Polish those buttons

Photoshop can produce graphic, Mac-style buttons on a single layer. *Trevor Morris* tells how.

Photoshop layer effects are easy to use, and just as easily abused. You should resist applying effects just because you can, reserving them for when they will clearly improve an image. For example, when making buttons, which is what we're going to do here.

An unenhanced button is a dull proposition, but with Photoshop's layer styles you can create classy Mac OS-type buttons on a single layer.

Other cool things about Photoshop effects and styles are that they are editable, scalable and result in smaller file sizes.



Not so bitter: *a finely finished Aqua pill button.*

PATTERN MAKING

From this point on, the unit of measurement should be set to pixels. And Mac users should substitute Option for Alt; Command for Ctrl; and Ctrl+click for right-click.

Either right-click on the Rulers [Ctrl+R] (View, Rulers) and select Pixels, or choose Edit, Preferences, Units & Rulers [Ctrl+K, Ctrl+5] and select Pixels from the Rulers drop-down.

Before you start building your button, define a pattern resembling those trendy TV lines. You'll apply this later as a background using a Pattern layer. Open a new file using these values: Width, 1; Height, 2; Resolution, 72 (pixels/inch); and Mode, RGB Color, and choose White for Contents.

Reset the foreground and background colours to their defaults [D] by pressing the Default Colors button (below the foreground colour in the toolbar). Click on the New Layer button at the bottom of the Layers palette [Ctrl+Alt-Shift-N] to add a new layer. Fill the current layer with the foreground colour [Alt-Backspace] (Edit, Fill; Use: Foreground Color). Then choose Image, Canvas Size (or right-click on the document titlebar and choose Canvas Size) and enter 8 for the Height.

Apply Filter, Blur, Gaussian Blur with a radius of 0.6. Re-apply the filter with a radius of 2.5 [Ctrl+Alt-F]. Change the layer opacity to 30% [3] using the Opacity field/slider at the top of the Layers palette. Choose Select, All [Ctrl+A] followed by Edit, Define Pattern to have Photoshop "remember" the pattern until you need it.

You can close this pattern document at any time. There's no need to save it, but you can if you wish.

Effects versus styles

What's the difference between effects and styles? A layer effect is a single effect, such as a drop shadow or bevel and emboss. A layer style is a combination of one or more layer effects in conjunction with other properties such as opacity, blending mode and fill opacity.

POPPING A PILL

Create a new canvas called Aqua Pill and enter these values: Width, 200; Height, 100; Resolution, 72 (pixels/inch); and Mode, RGB Color and for its Contents choose Transparent.

Hold down Alt and choose Pattern from the New Fill/Adjustment menu (half black, half white at the bottom of the Layers palette). When the New Layer dialog box appears, enter "background" for the name and click OK. The Pattern Fill dialog box should appear. Verify that the pattern you defined appears in the preview area, and press OK to apply it. You won't be using the layer mask associated with this layer, so delete it by Alt-clicking on the Trash icon.

Assuming the colours are still set to their defaults [D], switch them to make white the foreground colour [X] (press the two-headed arrow above the background colour).

To create the pill shape for the button, use the Rounded Rectangle (Shape) tool [U]. In the Options palette (Window, Show Options), ensure the Shape Layer button (far left) is depressed and enter 30px for the (corner) Radius. Draw a rectangle about 160 pixels wide and 50 high. Use the Info palette [F8] (Window, Show Info) to see the dimensions while you drag out the rectangle.

To centre the button in the canvas, Select All, then select the Move tool [V] and press both the horizontal and vertical centre-align buttons in the Options palette. Drop the selection by choosing Select, Deselect [Ctrl+D] from the menus. You can name the layer with Alt-double-click on the layer on the Layers palette. When the Layer Properties dialog box appears, enter a name and press OK.

CLEARLY TRANSLUCENT

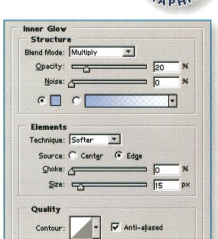
To make the button look translucent, use the Fill Opacity layer property to lower the opacity of the shape layer without affecting the style you're going to apply. Double-click on the shape layer's name in the Layers palette to access the Blending Options page of the Layer Style dialog box. Lower Fill Opacity to 0% but don't hit OK yet. You'll need this dialog box to add seven effects for that eplastic look.

Select Color Overlay (click on the name, not just the checkmark) from the list of effects on the left. Enter these values for the overlay:

On the edge: *the Contour settings sharpen the bevel highlight.*



Glowing: *use the depicted settings to treat the Inner Glow as a second inner shadow.*



Color R185,G230,B255 [#B9E6FF] and Opacity 40% (the rest default).

To give depth to the button, choose Bevel and Emboss and enter: Depth 55%, Size 16px, Soften 10px, Angle 90°, Use Global Light unchecked, Altitude 80°, Anti-aliased checked, Highlight Opacity 100%, Shadow Color R25,G45,B75 [#192D4B] and Shadow Opacity 70%. Sharpen the highlight a bit by adding a Contour (below Bevel and Emboss in the effects list).

On the Contour page, choose Half Round from the Contours drop-down, enable the Anti-aliased option and set Range to 100%. Again, leave the other values to their defaults.

Select Gradient Overlay and set Blend Mode to Multiply and Scale to 60%. To customise the gradient, click on the gradient thumbnail (not the drop-down button). When the Gradient Editor appears, click on the left (black) colour stop below the gradient — the stops above control the opacity. The Color field below should become active; click on it to open the Color Picker. Change the colour to R225,G255,B255 [#E1FFFF] and press OK. Repeat this process to change the colour stop to R80,G100,B130 [#506482]. Click OK to accept the gradient and close the Gradient Editor dialog box.

INNER GLOW

Your button needs a few more effects to bring it to life. Choose Inner Shadow from the effects list and enter: Color R70,G105,B205 [#4669CD], Opacity 50%, Angle 90°, Use Global Light checked, Distance 10px, Choke 36%, Size 38px and Anti-aliased checked.

Use (and abuse) Inner Glow as a second Inner Shadow by entering: Blend Mode Multiply, Opacity 20%, Color R130,G160,B240 [#82A0F0], Size 15px and Anti-aliased checked.

Use the Satin effect to brighten the interior effects with: Blend Mode Color Dodge, Opacity 10%, Angle 0°, Distance 1px, Size 0px, Contour Linear, Anti-aliased checked and Invert checked. Lastly, apply a drop shadow with: Color R45,G70,B130 [#2D4682], Opacity 40%, Angle 90°, Use Global Light checked, Distance 10px, Spread 5px, Size 12px, Anti-aliased checked and Noise 3%.

Press OK to apply the style. It looks impressive, but more impressive still is the fact that it's all created with a single layer. This might be a good time to save your work.

Now add the button label. Select the Type tool [T] and establish these settings in the Options palette: Font Myriad (or Lucida Console or whatever font you like), Style Roman (or Regular), Size 36pt, Anti-aliasing Crisp, Justify Center and Color black (R0,G0,B0) [#000000]. Press the palettes button to reveal the Character and Paragraph palettes. In the Character palette, enter 50 for Tracking. Click anywhere on the canvas to place the type cursor and type AQUA. Centre the type using the same technique as before: choose Select, All [Ctrl+A], select the Move tool [V] and press both the horizontal and vertical centre align buttons in the Options palette. Drop the selection [Ctrl+D] (Select, Deselect) when you're done.

You need to apply two more effects (that is, a style) to the type layer. Choose Drop Shadow in the Add Layer Style menu at the bottom of the Layers palette. In the dialog box enter: Color R30,G55,B95 [#1E375F], Opacity 40%, Angle 90°, Use Global Light checked, Anti-aliased checked.

To make the text look like it's on button's rounded surface, add a subtle Gradient Overlay with: Blend Mode Screen, Opacity 20%, Reverse checked, Scale 30%. Before pressing OK, click on the gradient thumbnail to open the Gradient Editor. Choose Foreground to Transparent from the Presets list at the top of the dialog box and set both colour stops, below the gradient thumbnail, to white (R255,G255,B255) [#FFFFFF]. Click OK to accept the gradient and click OK again to apply the Style. Don't forget to save.

SIZE UP THE SITUATION

Scale your image using the Image, Image Size command and the effects will not be scaled with the image as expected. To scale the effects, choose Layer, Layer Style, Scale Effects (or in the Layers palette, right-click on the effects icon for the desired layer and choose Scale Effects) and enter the percentage you scaled your image. This must be done for each layer with any associated effects.

Luckily, effects are resolution-dependant, meaning that if you simply change the resolution of the image, all effects will be "scaled" at the same time. You may then revert to the original resolution by turning off the resampling option.

For example, to triple the size of your new masterpiece, choose Image, Image Size (or right-click on the document titlebar and choose Image Size). Change Resolution to 216 pixels/inch (72 x 3 = 216) and press OK. Open the Image Size dialog box again and re-enter the original resolution (in this case 72 pixels/inch), but this time turn off the Resample Image option. The image and all effects are now three times larger but still at the same resolution.

Get the drop on shadows

Drop shadows tend to be overused and are often applied using default values, which are far too extreme. Check out these tips for creating subtler, more realistic shadows:

- *Lower opacity — 20-50% in most cases.*
- *Not all shadows are true black. Vary the tone, taking into account translucent properties that might complement the colour.*
- *Natural shadows are typically diffuse and specular. A little noise (3-5%) adds realism.*

Bonus CD software
You'll find a demo page of bookmarklets.

JavaScript on steroids

Cut the junk from Web pages and view them the way you want with JavaScript bookmarklets.

***David Williams* explains.**

Even though JavaScript embedded in Web pages runs in the user's Web browser, it's not something you have any control over. Web pages are coded by the original author; the user viewing the page can't add their own JavaScript to an existing site. At least, not until the arrival of bookmarklets, which is a JavaScript code that can be coded, controlled and activated by the computer user — on any Web page they like.

HOW SO?

The handy thing about bookmarklets is that it's already built into your Web browser. The trick is that your browser will run JavaScript code if you type it into the address bar, and use `javascript:` as the protocol prefix.

Normally you start with `http:`, as in `http://www.apcmag.com`. The `http:` specifies the protocol your Web browser uses to retrieve the page — in this case, the HTTP hypertext transport protocol.

Many don't realise that their Web browser also supports `javascript:` as a protocol, allowing real JavaScript programming code to be typed into the address bar and executed over the currently displayed page. This is the key to the power of bookmarklets. They are so named because you can simply save the JavaScript code as a bookmark in your Web browser's Favorites list — just like you would anything else that appears in the address bar.

Bookmarklets are safe because they still run within your Web browser and are protected by the sandbox environment it uses for all JavaScript code.

IN THE BEGINNING

Create a new bookmark in your Web browser. It doesn't matter at all if a page is currently open or not, because the address saved will need to be overwritten anyway.

Next, open the properties for the bookmark just saved. In Internet Explorer do this by right-clicking on the bookmark from your Favorites list. Select Properties from the pop-up menu.

Change the saved bookmark address — whatever it may be — to the following:

```
javascript:void(document.body.background='')
```

Click OK to save the modified bookmark. Your Web browser may prompt with a message saying "javascript: does not have a registered protocol handler. Save anyway?". Click Yes.

By necessity — having just the one line in the address bar to work with — the bookmarklet code is compact.

The bookmarklet is now available to you for use anytime. Navigate to a Web site such as the Hayloft at **http://lukas_k_duke.tripod.com/stories.htm**. This page has a background image which makes the text hard to read. Click on the bookmarklet just created. Your Web browser doesn't navigate away but instead executes the JavaScript code, removing the background image.

With bookmarklets you can control the appearance of any Web site you visit — regardless of who authored it, and how they wanted the site viewed.

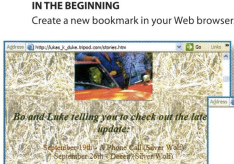
Another site with poor graphics is **www.rockfordillinois.com**, which is full of animated GIFs.

Create a bookmark. Edit its properties. Set the address to read:

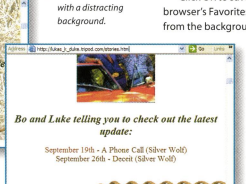
```
javascript:for(jK6bvW=0;jK6bvW<document.images.length;jK6bvW++)void(document.images[jK6bvW].style.visibility='hidden')
```

This bookmarklet is more cryptic. It loops through all the images on the page and sets their style to be hidden. The variable name `jK6bvW` has no special programming meaning — it's just an obscure variable name which is not likely to be used already on any given Web page.

Click OK to save the bookmarklet. Select it from the Web browser's Favorites menu and all the images have gone — apart from the background image itself (that can be disabled using the previous bookmarklet should it be needed).



***Before:** a Web site with a distracting background.*



***After:** the same site with a bookmarklet applied — now you can read the content much easier.*

FINDING PRE-WRITTEN BOOKMARKLETS

If you know JavaScript then you know everything you need to write your own bookmarklets.

However, as with most cool things, there is a large repository of free bookmarklets already on the Internet. These have been developed and tested and perform many useful functions. They can be found at **www.bookmarklets.com**. Be sure to also check the links page on this site to find other pre-written bookmarklets.

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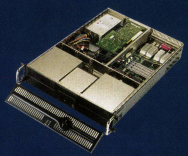
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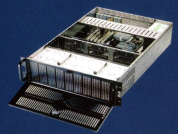
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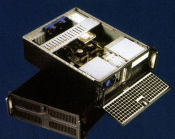
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PC

Rise of Nations

Civilisation mixed with Age of Empires is a potent brew developers have been trying, largely unsuccessfully, to replicate. However, *Justin Kranzl* says this game is as good as it gets.



Urban warfare: *auctions turn ugly as real estate prices soar.*

From Microsoft and Big Huge Games comes an exercise in compromise. Rise of Nations is a real time strategy (RTS) game that borrows elements from the still not dead, turn-based strategy genre.

Such crossover titles are a tough ask. Not only do the developers have to judiciously tweak the dynamic flow of an RTS with useful turn-based elements, there's also a demanding audience to contend with.

Medieval: Total War mixes the two styles successfully, but resource allocation takes a back seat to the manoeuvring of forces and court intrigue.

In the single-player "Conquer the World" campaign mode, Rise of Nations (RON) follows a similar model, leaving the faster style of play to the "quick play" and multiplayer modes.

The fact that the developer has taken key aspects of the strategy genre and pumped them up as much as possible sets RON apart from the RTS pack. Forget about a measly handful of choices for the sides you can play on, RON has 18 nations.

Trusty standbys the English and Germans are supplemented by choices like the Korean or Aztecs. Eight time periods mark your civilisation's advancement, from Ancient to Information ages. Even the visuals — more utilitarian than glossy — sport tonnes of animation and character. Although some extra distance could be employed between the four steps of magnification, there's often too much happening to fit on one screen.

When playing Rise of Nations, experienced RTS players will notice how the adaptation of other RTS ideas has made the final product stronger. A country border line allows you to intimidate neighbouring powers by building up troops and structures. This "line in the sand" opens up a whole new world of brinkmanship, particularly in multiplayer mode, where alliances are tenuous at best.

Winning conditions include scenarios that delay, or even prevent, military build up, judging solely on economic-based performance. It won't capture the imagination of the masses, but it's a handy alternative. And it's the kind of offering that helps make RON that little bit better than the competition.

Rise of Nations is a collection of other games' winning ideas, amalgamated into an excellent end result. No other game comes quite as close to the strategy gamer's match made in heaven — Civilisation blended with Age of Empires.

While the single player mode is stronger and more of a draw than multiplayer, there's plenty of variety and differing winning conditions to please the online and LAN crowd.

Rise of Nations plays very differently to more multiplayer oriented products, which means veteran RTS players will miss out on a lot of enjoyable diversions in the pursuit of a win. It also means novices could be denied the game's more engrossing subtleties when playing opponents with a win-at-all-costs approach. But the dedication paid to making this a class product exceeds these issues.

RON may not be the best-looking RTS, or have a long multiplayer lifespan, but it's difficult to find a deeper, more rewarding RTS experience.

Online *www.riseofnations.com*
Price *$99.95*
Verdict ●●●●●

PC

Enter the Matrix

A million were sold in its first week of European and US release, but the companion game to *The Matrix: Reloaded* lacks the expected refinement and depth.



Climbing the walls: *acrobatics become all too mundane in Shiny's Matrix.*

Developer Shiny Games has a history of producing flawed masterpieces. The company's past shortcomings have never lacked imagination or flair, rather it's been in the implementation of ideas failing to meet lofty ambition. Sadly, there's little innovation or originality in Enter the Matrix (ETM).

While the film's roots lend themselves admirably to a video game, the game itself offers nothing that hasn't been done before (and better too).

The biggest disappointment are the visuals — not only do they choke up even a high-spec machine, the quality of animation is wildly erratic and player and environmental movement ranges from silky to stuttery. Perhaps the developers believe there's no need for properly functioning knee and elbow joints in the world of the Matrix, such is the robotic nature of the players' movements.

Environments are laid out with little thought towards flowing game play. For a game meant to perfectly recreate the Matrix universe, this is curious.

And the camera tracking and angles in standard playing modes are diabolical.

A saving grace is that Matrix standbys — the flashy effects — are recreated in fine form. But, like the game's exceptional sound output and orchestration, it fails to disguise its serious issues.

Film sequences shot for Enter the Matrix flesh out *The Matrix: Reloaded* storyline somewhat, which is to be applauded. As far as games go, ETM has a solid story behind it.

Given that it was written by *Matrix* creators, the Wachowski brothers, it's no surprise. However, the makers have resisted the temptation to allow players to assume the roles of Neo, Trinity or Morpheus, instead giving you the option to playing as *The Matrix: Reloaded* sidekicks Niobe or Ghost. There are two effective games in one, with the non-human controlled character assuming a supporting role.

The combat mechanics of the game are hard to fault. Liberal amounts of the now infamous "bullet time" effect can make even the most clumsy gamer look graceful. ETM allows players to reproduce spectacular stunt moves with, perhaps too much, ease. The lack of challenge involved in unleashing a dazzling array of fists, feet and bullets rapidly diminishes the incentive to keep playing.

Shiny attempts to encourage players' interaction with the scenery and environment, but inconsistent approaches to camera angles makes it painstaking. After all, you can usually accomplish the same task in less time by running up to a foe and laying into them.

The bad news is that the combat is pretty much its gameplay highlight. Supplementary driving and shooting modes offer little to the experience except serving as transition points to the next building sweep-and-clear.

There is one notable exception — ETM allows players to branch off and engage in a little hacker-style exploration, command prompt included.



Rare highlights: *hand-to-hand combat is one of the game's few strong points.*

It won't change your opinion of the game, but unlike the driving scenes, it's better in than out.

A multiplayer option also would have been better in than out. Shiny and Atari missed the boat on this one too, with Ubi Soft set to release a Matrix multiplayer online game.

Enter the Matrix promises so much. A talented developer, coupled with the movie's writers, is a wicked combination for success, yet it's incomplete.

The pressure to get the game out in time to match the cinema release of *The Matrix: Reloaded* leaves gamers with a fleetingly enjoyable experience at best.

The frustrating part is that it's not a bad game. If the rest of the game could match the quality of the story and sound, it would be strong enough to forgive the lack of a multiplayer option.

Viewed as a package, Enter the Matrix generally conveys the Matrix atmosphere and style. But as a game, it lacks the refinement and depth that gamers expect.

If you can do without seeing the "shot for the game" footage, and have managed to resist the urge to buy thus far, you can live without it.

And if for some inexplicable reason you're a Matrix fan who doesn't own the game, the best advice is to rent first or better still, wait for the sequels.

Without *The Matrix: Reloaded* hyperbole blinding the eyes of fans, ETM is well short of what it should be, despite booming sales making it the best-selling movie licensed game ever.

Online *www.enterthematrixgame.com*
Price *$99.95*
Verdict ●●◐○○

Medieval Total War: Viking Invasion PC

Viking Invasion is set in the Dark Ages, long before the European conflict that formed the backdrop of the original Medieval Total War (MTW). The Viking horde is invading England, a country which is splintered into competing regions after the withdrawal of the Romans.

Players can take on the role of the invaders or any of the defending kingdoms.

To cater to the new, tighter focal point of the action, the strategic map is restricted to England and the invader's home soil. Regardless of who you're playing — the Vikings or one of the eight English factions — your objective is the same: total rule over a unified England.

Viking Invasion's similarity to its predecessor ends with the game mechanics — the add-on pack makes for an entirely different, deeper playing experience.

Flexibility is the watchword. Not only are the English kingdoms scaled quite differently in terms of difficulty, but the Norse make for an exciting addition to the MTW world.

As a nice touch, new factions have been added from the original: Aragonese, Sicilian and Hungarian.

Combined with the different era and changed battlefield, it makes Viking Invasion ideal for MTW fans seeking a new challenge.



2D or not 2D: *the strategic phase is only half the battle.*

Online *www.totalwar.com*
Price *$49.95*
Verdict ●●●●◐

Vietcong PC

Developed by Czechoslovakia's little-known Pterodon team, Vietcong puts you in the fatigues of Sergeant Steve Hawkins. On patrol with his squad in hostile territory, he's supposed to lead his team out of harm's way, or into harm's way, depending on a given mission's criteria.

Your control options extend beyond Hawkins. You can issue orders to exert rudimentary control over your team.

But you won't get the same teamwork feel as the likes of Battlefield 1942. What you do get is close firefighting and a fantastic impression of "being there". Diving for cover with bullets zipping everywhere is heady stuff.

With the odd aberration, the game's AI seems quite sophisticated, and in combat situations the CPU doesn't throw its life away.

If your PC has the chops to handle high resolutions, Vietcong is a very attractive game. Friends and foe move realistically, and while the foliage isn't photo-realistic, it's good enough while you're in motion.

With Vietcong making a decent fist of the combat of the 1960s and '70s, it's a fair bet Vietnam will be the next games bandwagon for developers.

The game doesn't beat any competing title on individual criteria, but the sum of its parts is engrossing.



On patrol: *the Sarge goes looking for trouble.*

Online *www.vietcong-game.com*
Price *$99.95*
Verdict ●●●●○

Return to Castle Wolfenstein: Tides of War XBOX

It's usually hard to wipe the smirk off PC owners' faces when a popular title is ported from x86 (or Apple) to console. The shortcuts, compromises and workarounds in most console versions of PC hits cause much smug finger-pointing.

But the Xbox version of Return to Castle Wolfenstein: Tides of War (RTCW: TOW) is proof that ports to consoles don't have to be of lesser quality. If you're willing to accept the inherent shortcomings of a console controller, this is an excellent first-person shooter, second only to the mighty Halo.

RTCW: TOW matches up well with the PC original. It even adds extra playing levels. But keyboard and mouse always trump a controller in first person shooters, and 30fps may seem miserly to PC owners.

But put these differences aside and, like the PC version, the real attraction for Xbox owners is the multiplayer facility. RTCW: TOW will come into its own once Xbox Live gets underway in Australia, with support for 16-player multiplayer.

Co-op mode in split screen is also supported, but adversarial modes aren't. The decision makes sense given the game's team-based ethic.

The key issue is this: while single and co-op modes are nice, the real test with Xbox Live is yet to come. Our advice? Play the waiting game.



Evil empire: *fight the Hun first-person one more time.*

Online *www.castlewolfenstein.com*
Price *$99.95*
Verdict ●●●●○

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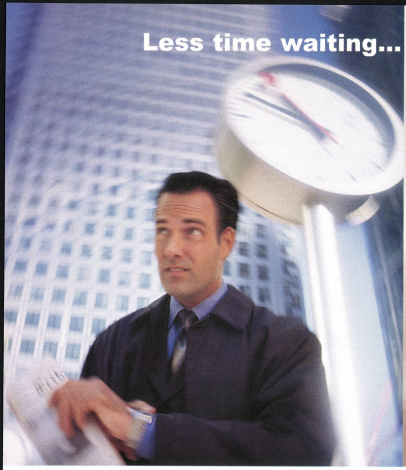
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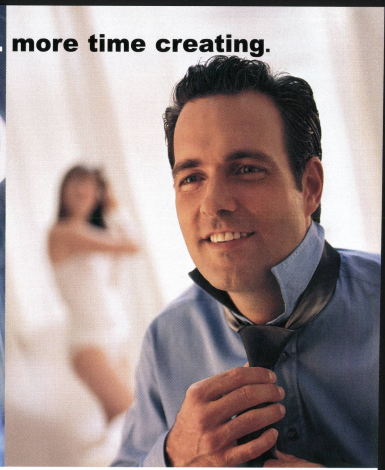
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Insider Power Techniques

for Windows XP

This is a practical guide to extracting every bit of performance and stability from Windows XP. It would be suitable for desktop support staff who are maintaining XP-based environments, and those techies wanting to impress.

Areas explored include locking down desktops with group policy; automating tasks with VBScript and Command scripts (with coverage of the VBScript objects that define various parts of Windows, IE, and Microsoft Office). Also, performance tuning via tweaks, registry hacks and tools available (in the OS, Powertoys and Microsoft Web site); and running older apps via compatibility mode.

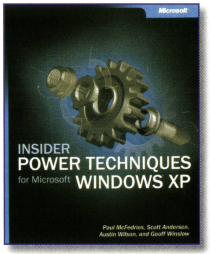
Additionally, BootVis is examined (this determines what comprises the time taken for an XP machine to start), and tuning settings for the Windows prefetcher.

The troubleshooting section provides a structured approach to isolating problems on an XP machine. However, not all techniques are useful to the book's target audience — information on Windows Media Player's keyboard shortcuts isn't really practical. And like many Microsoft Press books, this title is limited to Redmond's own tools and supported configurations.

As a result, you won't read about third-party tools, the fact that it's better to use Google to search the Knowledge Base than Microsoft's own search tool, or that running unsigned device drivers could improve 3D performance.

That said, it's good value and jam-packed with useful stuff.

Mike MacCana



Publisher *Microsoft Press*
Price *$69.95*
ISBN *0735618968*

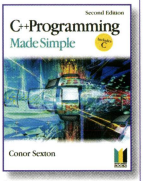
C++ Programming

Made Simple, second edition

It seems remarkable that you can still find elementary programming books without reference to a specific platform, technology or application.

C++ Programming Made Simple is an example of this, emphasising the 1998 ISO C++ standard. This book updates two earlier works by the same author, *C Programming Made Simple* and the 1997 edition of *C++ Programming Made Simple*.

Not only were there changes to the C++ standard between 1997 and 1998, but in that era, C and C++ were still considered distinct languages. C++ was looked upon as an "upgrade" from C, and a C++ book might, reasonably, assume the reader has prior knowledge in C.



Publisher *Made Simple Books*
Price *$52.80*
ISBN *0750657383*

Right now, the distinction is blurry: C++ is a complete language, having subsumed C; most C compilers permit C++-like structures and syntaxes; and C++ programmers may not have any knowledge of C.

Hence, this is essentially a reworking of the author's original two works, thus producing a single volume relevant to present day. But of course, most of us have moved on since the original two works.

However, this could be a useful purchase for students learning programming — although courses now are likely to be teaching Java or C#.

This particular Made Simple Books offering doesn't exhaustively cover the C++ standard libraries — the most advanced topic is stream I/O for file manipulation for instance. Rather, the title is a very easy-to-read and pleasant introduction to C++ programming in general.

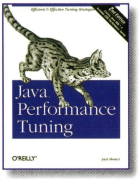
David Williams

Java Performance Tuning

second edition

This may be the best Java book we've ever seen! One reason why is that performance for Java has always been a big issue: "Don't use Vector, use ArrayList — it's more efficient"; "Don't concatenate Strings, use a StringBuffer — it's more efficient".

Of course, a significant problem with such rules of thumb is that when running in a dynamic, managed environment like the Java Virtual Machine (JVM), there are other factors out of your control. Also, it can be difficult to assess whether one piece of code will be "more efficient" than another without testing with actual usage patterns.



Publisher *O'Reilly and Associates*
Price *$116*
ISBN *0596003773*

Thankfully, this book provides substantial benchmarks with thorough coverage of the Java Development Kit (JDK), including loops, exceptions, strings, threading, and even underlying JVM improvements in the 1.4 VM.

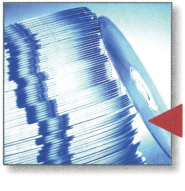
Readers of the older version will appreciate the additional information presented on JavaServer Pages, Servlets, Enterprise JavaBeans, Java Database Connectivity and Java NIO.

Although it provides detailed tuition on how to utilise various profiling tools in analysing a program's behaviour, the main aim of this title is to furnish software developers with all the information they need when adopting tuning options.

David Williams

Next month...

In the September issue of apc



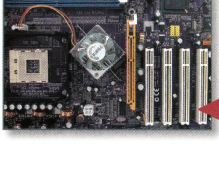
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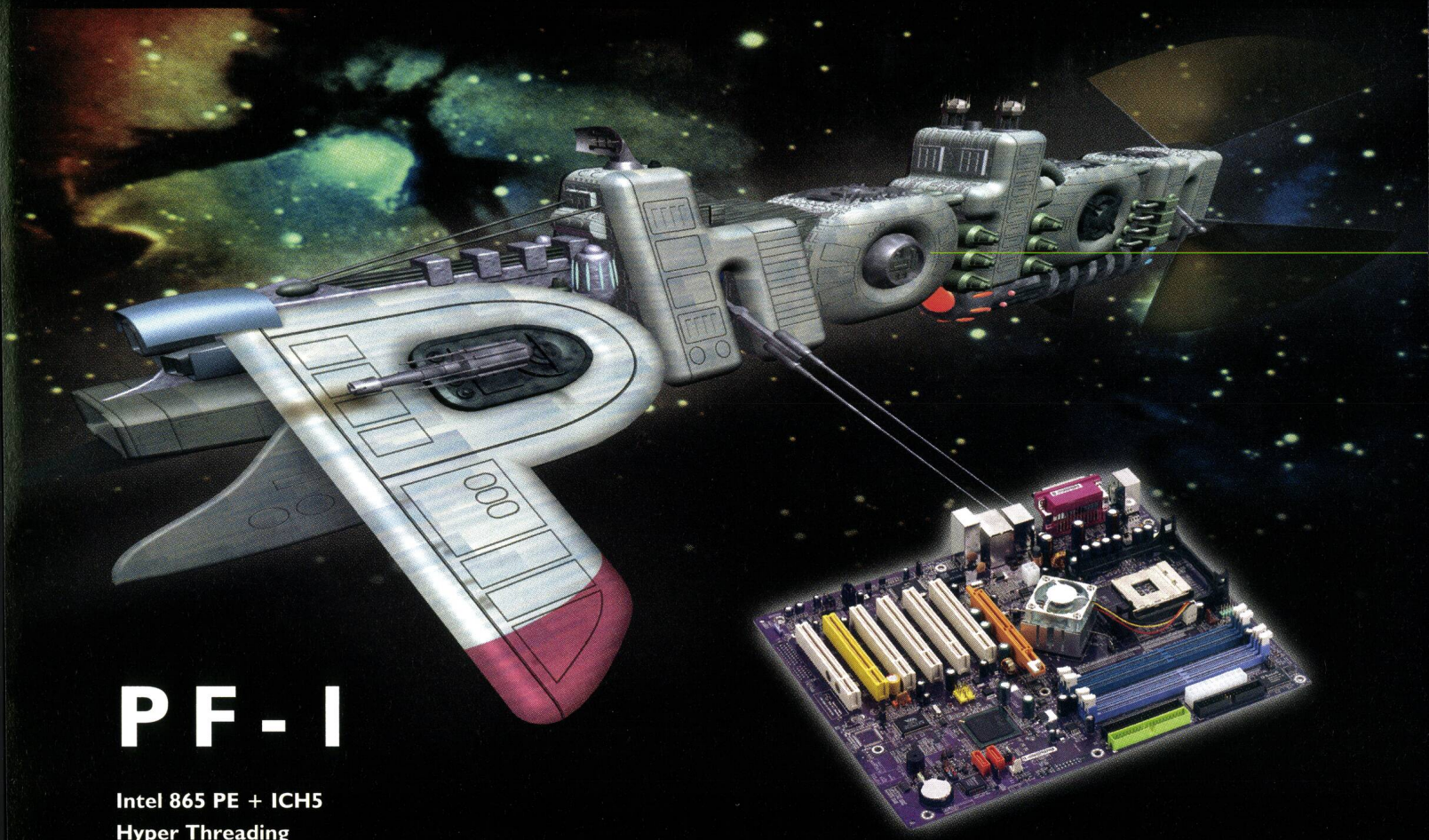
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Intel 865 PE + ICH5
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Dual DDR 400
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3 COM Gigabit LAN
Up to 8 USB 2.0 ports
IEEE 1394, S/PDIF
6 PCI Slots

Bundled Software:
Elite Castle 3D Desktop
Anti-Burn Guardian
OMNI Guardian
PC-Cillin
Win DVD Creator
Win Rip 2

Bundled Utilities:
Data Back Utility
AC Resume
EZ Flash
My Picture Utility
Top-Hat Flash BIOS Security
Time Recovery

PHOTON

865 Series Mainboard

PC-cillin Your Internet VirusWall
InterVideo WinRip 2
6 Channel DVD Audio
Dual Channel DDR 400+
SERIAL ATA
AGP 8x
C-Boost
PCI Extreme
AC Resume
Intel® Chipset Pentium® 4 Processor HT Technology
showshifter
WinDVD CREATOR
IEEE 1394
USB 2.0
SuperRAID
Anti-Burn Guardian
Omni Guardian
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Web Site: www.protac.com.au
Email: supports@protac.com.au

www.newreality.com.au

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CANON COMPATIBLES FROM $6.00

Code	OEM Equivalent	Compatible With:	Price
CC-1BK	BJI-642	BJ-300/330 Black	$12.00
CC-2BK	BJI-201BK	BJC-600/610/620 Black	$6.00
CC-3BK	BJI-643BK	BJC-800/820 Black	$12.00
CC-4BK	BCI-21	BJC-2000/4000/5000 Series Black	$7.00
CC-5CL	BCI-21C	BJC-2000/4000/5000 Series 3-Colour	$12.00
CC-6BKHC	BJI-201BK HC	BJC-600/610/620 HI-Cap Black (14ML)	$9.00
CC-7BK	BCI-10	BJ-30 Black	$9.00
CC-8BK	BCI-11	BJC-70 Black	$9.00
CC-9CL	BCI-11C	BJC-70 3-Colour	$17.00
CC-11CL	BCI-61	BJC-7000 Series 3-Colour	$32.00
CC-12PCL	BCI-62 PHOTO	BJC-7000 Series Photo 6-Colour	$38.00
CC-13B	BCI-3	BJC-6000 Black	$25.00
CC-14C	BCI-3C	BJC-6000 Cyan	$16.00
CC-15M	BCI-3M	BJC-6000 Magenta	$16.00
CC-16Y	BCI-3Y	BJC-6000 Yellow	$16.00
CC-17PBK	BCI-3PBK	BJC-6000 Photo Black	$18.00
CC-18PC	BCI-3PC	BJC-6000 Photo Cyan	$18.00
CC-19PM	BCI-3PM	BJC-6000 Photo Magenta	$18.00

100% COMPATIBLE WITH YOUR CANON PRINTER



BUY 3 GET 1 FREE*

*Free cartridge must be of equal or lesser value than the lowest priced cartridge purchased



FREE DELIVERY AUSTRALIA WIDE

EPSON COMPATIBLES FROM $17.00

Code	OEM Equivalent	Compatible With:	Price
CE-51BK	SO20025	STYLUS 800/1000 Black	$16.00
CE-52BK	SO20034	STYLUS Colour/Colour Pro Black	$20.00
CE-53CL	SO20028	STYLUS Colour/Colour Pro 3-Colour	$30.00
CE-54BK	SO20047	STYLUS 200/820/Colour II /IIs Black	$13.00
CE-55CL	SO20049	STYLUS 200/820/Colour II /IIs 3-Colour	$21.00
CE-56PBK	SO20093	STYLUS Colour 400/500/600/Photo Black	$17.00
CE-57CL	SO20097	STYLUS Colour 200/500 3-Colour	$23.00
CE-58BK	SO20108	STYLUS Colour 800/850/1520 Black	$17.00
CE-59CL	SO20089	STYLUS Colour 400/600/800/1520 3-Colour	$23.00
CE-60PCL	SO20110	STYLUS Colour 700/Photo/Photo 700 5-Colour	$26.00
CE-61BKCL	SO20138	STYLUS Colour 300 4-Colour	$31.00
CE-65BK	SO20187	STYLUS Colour 440/640/660 Black	$16.00
CE-66BK	SO20189	STYLUS Colour 740/760 Black	$16.00
CE-67CL	SO20191	STYLUS Colour 440/640/660/740/760 3-Colour	$26.00
CE-68PCL	SO20193	STYLUS Photo 750 5-Colour	$33.00
CE-69CL	T003011	STYLUS Colour 900 Black	$19.00
CE-70CL	T005011	STYLUS Colour 900 Colour	$24.00
CE-71PCL	T001011	STYLUS Photo 1200 5-Colour	$29.00
CE-27BK	T007	STYLUS Colour 870/1270 Black	$24.00
CE-73CL	T008	STYLUS Colour 870 Colour	$29.00
CE-74CL	T009	STYLUS Colour 1270 Colour	$34.00

100% COMPATIBLE WITH YOUR EPSON PRINTER



BUY 3 GET 1 FREE*

*Free cartridge must be of equal or lesser value than the lowest priced cartridge purchased

New Reality's compatible inkjet cartridges will save you up to 60% when compared with the cost of original manufacturers cartridges.

Our cartridges are guaranteed to print as good if not better than the original. Just click them in and $ave!

If you are not 100% satisfied with our cartridges return them and we will refund the full purchase price.....guaranteed!



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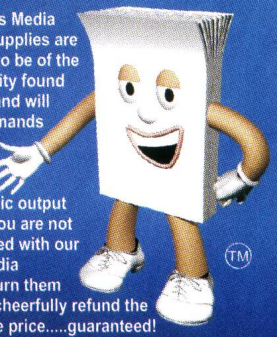
Product Code	Description	Sheets	Price	Price per Sheet
A4HRP	A4 90gsm Hi-Res Paper	100	$ 15.00	0.15
A3HRP	A3 90gsm Hi-Res Paper	100	$ 30.00	0.30
A4WF	A4 White Film 100mu	50	$ 47.00	0.94
A3WF	A3 White Film 100mu	50	$ 90.00	1.80
A4CF	A4 Clear Film 100mu	50	$ 39.00	0.78
A3CF	A3 Clear Film 100mu	50	$ 71.00	1.42
A4FGP	A4 Full Gloss Photo Paper	50	$ 44.00	0.88
A3FGP	A3 Full Gloss Photo Paper	50	$ 79.00	1.58
A4PH	A4 Economy Photo Paper	50	$ 23.00	0.46
AC2	Artists Canvas	25	$ 60.00	2.40
GC4F	Greeting Card (4 Fold)	100	$ 28.00	0.28
GCBF	Greeting Card (Bi-Fold)	100	$ 48.00	0.48
DCCS	Double Coated Card Stock	50	$ 24.00	0.48
GCS	Glossy Card Stock	50	$ 24.00	0.48
TTP	T-Shirt Transfer Paper	15	$ 15.00	1.00
MP	Magnetic Paper	25	$ 58.00	2.32
BC1	Business Cards (10 per A4)	20	$ 19.00	0.95

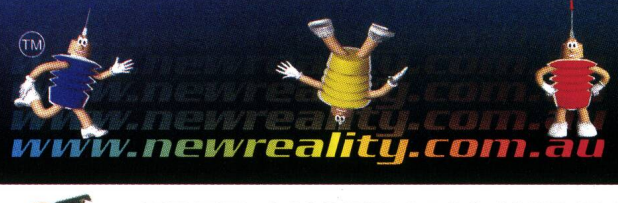


INCLUDES:
90gsm coated paper, 90gsm hi-res paper, white film, clear film, full gloss photo paper, economy photo paper, greeting card (4 fold), greeting card (bi-fold), glossy card stock, t-shirt transfer paper, business cards and magnetic paper!



New Reality's Media and Paper supplies are guaranteed to be of the highest quality found world-wide and will meet the demands of today's printers including photo realistic output printers! If you are not 100% satisfied with our paper or media supplies return them and we will cheerfully refund the full purchase price.....guaranteed!





AUSTRALIA WIDE FREECALL

1800 680 605

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SUPERIOR PERFORMANCE INKJET REFILL KITS

REFILL & SAVE AT LEAST 80% OFF PRINTING COSTS

BLACK REFILL KITS FROM ONLY $24.90

Black kits include superior, dense & sharp black inks

DESCRIPTION (Kits Compatible with Printers listed below)	No. of Refills	Product Code
CANON BJ-30	60	20-BKL
CANON BJC-70/BJC 80	60	21-BKL
CANON BC-01/02 BJ-10E/20 BJ-200 Series & BJC-1000 Series	9	3-BKL
CANON BJ-300/ 330	7	4-BKL
CANON BJC-600/610/620	12	5-BKL
CANON BJC-2000/4000/4100/4200/4300/4550/5000/5500 BCI-21	45	19-BKL
CANON BJC-2000/4000/4100/4200/4300/4550/5000/5500 BC-20	9	18-BKL
CANON BJC-3000/6000/8000 Series	12	46-BKL
HP Desk Jet 400/500 Series	6	8A-BKL
HP Desk Jet 600/660/690 Series	6	8B-BKL
HP Desk Jet 700/800/900/1000 Series	8	29-BKL
HP Desk Jet 300 Series & Olivetti JP's!	8	7-BKL
EPSON Stylus 400/800/800+/1000	8	1-BKL
EPSON Stylus Colour /PRO/XL	12	2-BKL
EPSON Stylus 820/colour II/IIs	12	23-BKL
EPSON Stylus Colour 200/300/400/500/600/800/850/1520	12	33A-BKL
EPSON Stylus Colour 440/460/480/640/660/700/740/760/900	12	33B-BKL
IBM/LEXMARK 4076/1000/1020/2000/2030/2050 Series	12	35A-BKL
IBM/LEXMARK 5000/5700/7000 & Z Series	12	35B-BKL
CANON, EPSON, HP Fluorescent & Photo Realistic Kits!		Please Call!



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COLOUR REFILL KITS FROM ONLY $34.90

Colour kits include cyan, magenta & yellow inks

DESCRIPTION (Kits Compatible with Printers listed below)	No. of Refills	Product Code
CANON BJC-70/80	3x30	22-CLR
CANON BJC-210/210SP/240/255/265/1000 Series	3x12	25-CLR
CANON BJC-600/610/620	3x8	10-CLR
CANON BJC-2000/4000/4100/4200/4300/4550/5000/5500 BCI-21	3x30	17-CLR
CANON BJC-3000/6000/8000 Series	3x8	47-CLR
HP Colour Desk Jet 300/400/500 Series & Olivetti!	3x12	14A-CLR
HP Colour Desk Jet 600C/660C/690C Series	3x12	14B-CLR
HP Desk Jet 850C/855C/870C/1000C Series	3x3	30A-CLR
HP Desk Jet 710/720/890/900 Series	3x3	30B-CLR
EPSON Stylus Colour /PRO/XL	3x4	16-CLR
EPSON Stylus 820/colour II/IIs	3x12	24-CLR
EPSON Stylus Colour 200/300/400/500/600/800/850/1520	3x12	34A-CLR
EPSON Stylus Colour 440/460/480/640/660/700/740/760/900	3x12	34B-CLR
IBM/LEXMARK 4076/1000/1020/2000/2030/2050 Series	3x6	36A-CLR
IBM/LEXMARK 5000/5700/7000 & Z Series	3x6	36B-CLR
CANON, EPSON, HP Fluorescent & Photo Realistic Kits!		Please Call!



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USING NEW REALITY'S INKJET REFILL KITS WILL NOT VOID YOUR PRINTER'S WARRANTY.

New Reality Resources has no affiliation with any printer manufacturers or OEM's and nor has any arrangement been made with them to form the basis of any statements we make.



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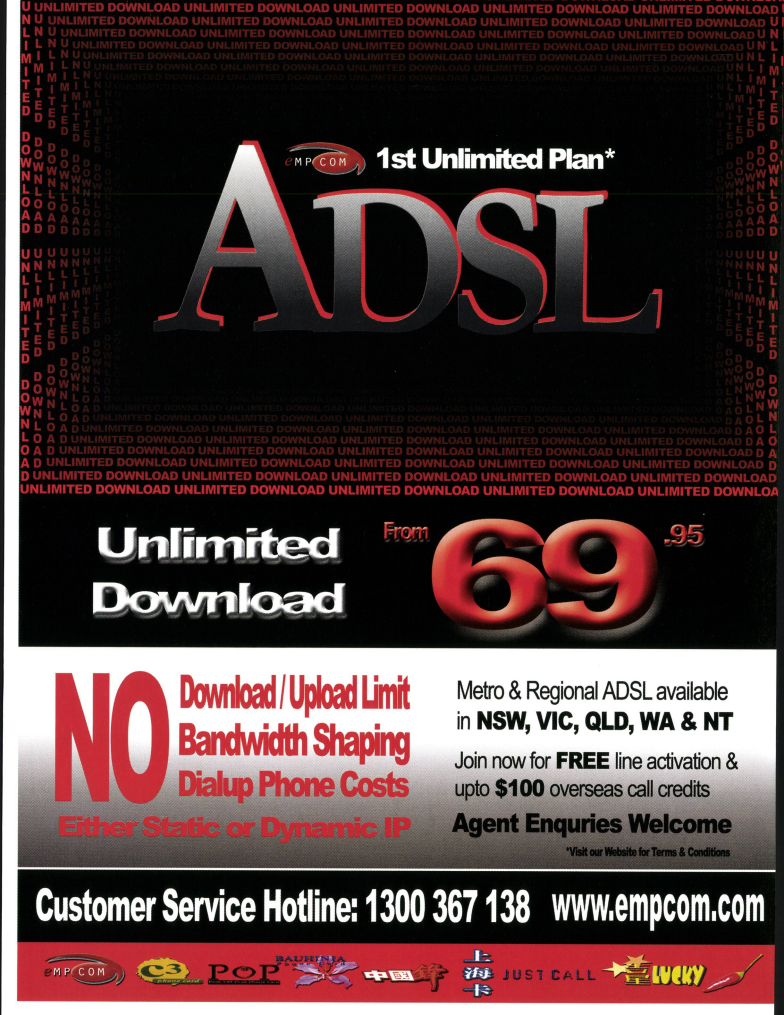
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AUSTRALIA WIDE FREECALL
1800 680 605

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1st Unlimited ADSL Broadband Internet

ENQUIRY 1300 367 138

Please complete one application form for each ADSL request and fax to (02) 9209 4627 or mail to : PO Box 483, Alexandria NSW 1435

Empcom Pty Limited
ABN : 72 088 110 258

Prior to submitting this form please ensure the ADSL line chosen is an active Telstra phone line. Subject to availability in your area.

A . Customer Details

Company name (if applicable): _____

ABN: _____

Title: Mr / Mrs / Miss / Ms / Others

First Name: _____

Last Name: _____

Street Address: _____

_____

City/Suburb: _____

State: _____ Postcode: _____

Daytime Phone: _____

Evening Phone: _____

Mobile Number: _____

Fax: _____

Email: _____

Billing / Postal Address (if different from above)

Address / PO Box: _____

City/Suburb: _____

State: _____ Postcode: _____

B. ADSL Service Details

1) Address Service Required at:

Street Address: _____

_____

Suburb: _____ Postcode: _____

2) Phone number for Empcom ADSL to be connected to:

☐☐ – ☐☐☐☐ – ☐☐☐☐

Note :

1. Customer must be the owner of the telephone number linked with ADSL. Otherwise an authorisation letter must be completed with this application.
2. If Duet Service is installed you must specify the Primary number.
3. The ADSL line must not have other services such as: spectrum service, part of a rotary group, commander system, conference call facility, or PABX.
4. If you have a monitored (back to base) alarm system, a central filter or splitter will be required.

C. ADSL - Speed

	Usage / Download	Monthly Fee	
		Major Cities	Regional
1) 256 / 64 kbps	Unlimited	☐ $69.95	☐ $79.95
2) 512 / 128 kbps	Unlimited	☐ $99.95	☐ $109.95
3) 1.5M / 256 kbps	Unlimited	☐ $169.95	☐ $179.95

D. Plan Period

	Line Activation	Bonus Phonecard
☐ 1) 3 months	$199	$ 20
☐ 2) 12 months	$149	$ 50
☐ 3) 18 months	$ 0	$100

Remarks : 3 months payments in advance is required for non-credit card payment (Cash / Cheque / Money Order).

E. Optional - ADSL Accessories (Shipping Cost $20)

☐ USB Modem	$119	x ____qty
☐ 4 Ports Router with ADSL modem	$229	x ____qty
☐ 4 Ports Wireless Router with ADSL modem	$329	x ____qty
☐ Wireless Card (PCMCIA / PCI)	$118 / $138	x ____qty
☐ ADSL Micro Filter	$10	x ____qty

Credit Card Type : ☐ Bankcard ☐ MasterCard ☐ VISA ☐ AMEX

Credit Card Number : ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐ ☐☐☐☐ Authorisation Code

Cardholder's Name as Printed on Credit Card : _____ Expiry Date : ☐☐ / ☐☐

Signature : _____ Date : ☐☐ / ☐☐ / ☐☐ (d d / m m / y y)

I confirm I have read the "Terms of Service" and the "Acceptable Use Policy" of Empcom 1st Unlimited ADSL Broadband Internet which is listed on the company's Web Site www.empcom.com and by signing this application form I acknowledge that I accept these and agree to conform to these. I authorise Empcom Pty Ltd to deduct from my credit card account nominated above for the payment of the line activation, ADSL monthly fee in advance and/or other related costs.

Office Use Only	Admin By	Date	Tech By	Date	Dealer Name	Dealer Code
A/C #						

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$740

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P4 2.4GHz 800MHz FSB	$340
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P4 2.8GHz 800MHz FSB	$520
P4 3.0GHz 800MHz FSB	$775
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Gigabyte R9500	$305
Gigabyte R9200 64D	$155
ASUS V9280 S2	$383
ASUS V8170 Magic/T	$95
Leadtek A280 LETD	$250
Leadtek A180 MyVIVO	$170

128MB

Gigabyte R9800 PRO	$840
Gigabyte R9200 128D	$210
ASUS V9900/TD	$600
ASUS V9560/TD	$385
Leadtek A300 TD	$600
Leadtek A310 MyVIVO	$355

Leadtek A350 TDH MyVIVO



CineFX II Engine, 0.13 Micro Process, 128MB DDR Memory, Twin-Turbo II Cooling Fan, DirectX 9.0 & OpenGL 1.4 Support

$740

Creative I-Trigue 3300



$186

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Creative

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Inspire 2500	$85
Inspire 4400	$115
Inspire 5100	$180
Inspire 5200	$185
Inspire 5300	$230
Inspire 5600	$500
Inspire 5700D	$675
Inspire 6600	$245
MegaWorks THX 550	$680
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Audigy 2	$230
Audigy 2 Platinum	$430
Audigy 2 Platinum eX	$520
SoundBlaster Live! DE 5.1	$75
SoundBlaster Live! Platinum 5.1	$245
Extigy	$295

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ASUS P4C800 Deluxe	$390
ASUS P4P800 Deluxe	$295
ASUS P4PE Deluxe	$265
ASUS P4XP-X	$120
Gigabyte GA-8IPE1000 Pro	$245
Gigabyte GA-8PENXP	$390
Gigabyte GA-8IK1100	$280
Gigabyte GA-8KNXP	$430

Athlon XP / Duron

ASUS A7N8X Deluxe	$280
ASUS A7V8X-X	$145
Gigabyte GA-7N400 Pro	$210
Gigabyte GA-7NNXP	$310



Gigabyte GA-8KNXP Ultra

iB75P, B00FSB, Dual Channel DDR400, SATA, RAID, SCSI, Gigabit LAN, AGP 8x, Audio

$765

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CRT Monitors

17" BenQ V772	$195
17" Mitsubishi DV1770H	$220
17" Philips 107E	$205
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19" Mitsubishi DV1998e	$375
19" Philips 109S	$390

LCD Monitors

15" BenQ FP547	$485
15" Mitsubishi DV154	$595
15" Philips 150S4FG	$515
17" BenQ FP767	$755
17" Mitsubishi DV172	$920
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SONY SDMX52 15" LCD Monitor

Light Weight 4.8kg, 400:1 Contrast Ratio, 300cd/m² Luminance, 1280x768 Max Resolution, Digital FlexRes Technology, Built-in Speakers, Wall-mountable

$1280

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Inkjet Printers

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Canon S200SPx	$70
Canon S330	$135
Canon S530D	$355
Canon S830D	$620
Epson Photo 830	$275
Epson Photo 915	$430
Epson Photo 925	$695
Epson Photo 1290 Silver	$960
HP DeskJet 3325	$70
HP DeskJet 3420	$90
HP DeskJet 3820	$135
HP DeskJet 5550	$180

Laser Printers

Canon LBP-1120	$375
Canon LBP-1000	$860
Epson EPL-5900	$605
Epson EPL-6100L	$470
HP LaserJet 1000	$455
HP LaserJet 1300	$770

Canon ImageCLASS D680

Digital Copier, Laser Printer & Fax all-in-one, 12cpm up to 1200x600dpi, 12ppm up to 2400x600dpi, 79 pages fax memory, 30-sheet Auto Document Feeder



$1200

SONY DRU510A

4XDVD±RW, 24XCD-R, 10XCD-RW, 8XDVD-ROM, 32XCD-ROM



$610

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4KUS 52x24x52x	$65
ASUS 52x24x52x	$75
BenQ 52x24x52x	$70
Lite-On 52x24x52x	$70
Sony 52x24x52x	$110

DVD-ROM Drives

4KUS 16x	$55
ASUS 16x	$75
BenQ 16x	$60
Lite-On 16x	$60
Mitsubishi 16x	$75
Sony 16x	$85

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WD600JB 60GB 8M Buffer	$150
WD800JB 80GB 8M Buffer	$155
WD1200JB 120GB 8M Buffer	$220

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Barracuda 7200.7 80GB	$160
Barracuda 7200.7 120GB	$225
Barracuda 7200.7 160GB	$300
Barracuda Serial ATA 80GB	$250
Barracuda Serial ATA 120GB	$270

Maxtor

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DiamondMax Plus 9 80GB	$155
DiamondMax Plus 9 120GB	$190
DiamondMax Plus 9 160GB	$295
DiamondMax Plus 9 200GB	$440

Western Digital 200GB

7200 RPM, ATA100, 8MB Buffers



$390

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Canon

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HP

PhotoSmart 620	$400
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3.2 Mega Pixel, 3x Optical Zoom, 12 Shooting Modes, Movie Recording & Playback with Sound (640 x 480)



$595

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Canon CanoScan 8000F

2400x4800 dpi, 48 bit, USB2.0, FARE Technology, Film Scanning,

$525

Canon CanoScan

LiDE20	$135
LiDE30	$195
LiDE50	$225
3000F	$265
5000F	$350

Epson Perfection

1260 Photo	$220
1660 Photo	$380
2400 Photo	$470
3200 Photo	$765

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3500C	$180
3570C	$265
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4570C	$430
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Valeur

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Integrated VGA, Audio & LAN
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Professionnel

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Tsumori -PL Series List

Basic Specification for PL series..

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Thickness=0.5mm~0.6mm
Q'TY for 20"/40"/40"HQ=590/1230/1440 PCS
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0305PL-PP
Whole case pearl white painting
7 color changed power led



0305PL-BB
Whole case black color painting
7 color changed power led



0301PL-BB
Whole case black color painting
RGB translucent fan+Dragon fan grill



0301PL
RGB translucent fan+Dragon fan grill



Dragon



UFO Spideman Lion King 4 Circle

Multi Choice for front fan grill styles..



8320PL-0S-B
Blue Led Pillars(Optional)



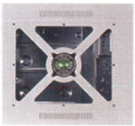
8320PL-BS-B
Blue Led Pillars(Optional)
Whole case black color painting
Butterfly side panel+80mm fan
+fan grill(Optional)



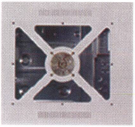
0303PL-BS-B
Dual blue led pillars(Optional)
7 color changed power led.



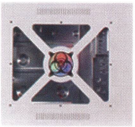
0303PL-BS-B
Blue Led Pillars(Optional)
Whole case black color painting
Butterfly side panel+80mm fan+fan grill(Optional)
7 color changed power led.



No. BU-2
Butterfly side panel
80mm dual led translucent fan
spideman fan grill



No. BU-1
Butterfly side panel
80mm dual led
Translucent fan
spideman fan grill



No. BU-3
Butterfly side panel
80mm RGB led
Translucent fan
4 Circle fan grill

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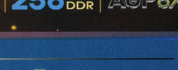
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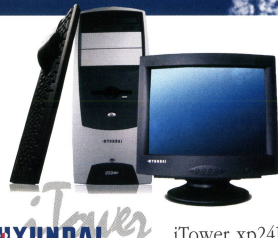
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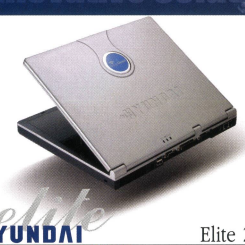
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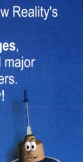
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CANON BJC-3000/6000/6200/8500/8000 & S400/S500 Series	3x8	47-CLR
CANON BJC-8200 & S800 Ser ss	3x6	53-CLR
HP Desk Jet 300/400/500 Series & Olivetti	3x12	14A-CLR
HP Desk Jet 600C/660C/690C Series	3x12	14B-CLR
HP Desk Jet 850C/855C/870C/1000C Series	3x3	30A-CLR
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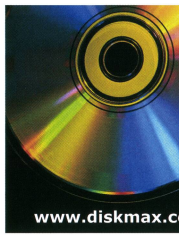
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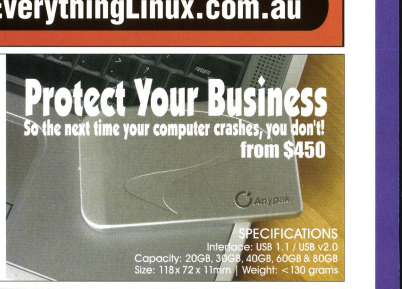
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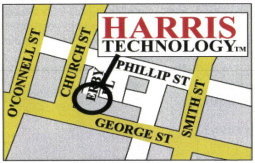
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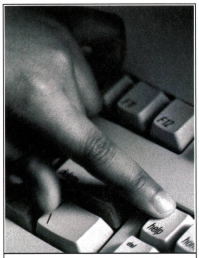
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MAX RESOLUTION	1024 x 768	1024 x 768	1024 x 768
POINTING DEVICE	Touch Pad	Touch Pad	Touch Pad
CD-ROM/DVD	DVD	Combo	Combo
VIDEO RAM (UMA)	16MB	16MB	16MB
56K v.90 & 10/100 LAN	Yes	Yes	Yes
WIRELESS LAN	Antenna Ready	Antenna Ready	Antenna Ready
WARRANTY	1 year	1 year	1 year
OP SYSTEM	Windows® XP Pro	Windows® XP Pro	Windows® XP Pro
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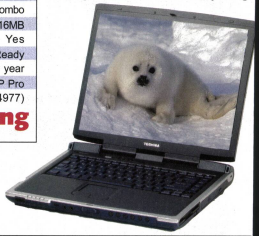


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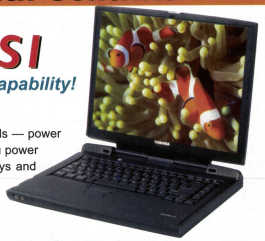
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SCREEN	14.1" TFT	14.1" TFT	15" TFT	15" TFT	15" TFT
MAX RESOLUTION	XGA	XGA	XGA	XGA	UXGA
CD-ROM/DVD	DVD/CD-RW	DVD/CD-RW	DVD/CD-RW	DVD/CD-RW	DVD RAM-R-RW
VIDEO RAM	16MB	16MB	32MB	32MB	32MB
56K v.90 & 10/100 LAN	Yes	Yes	Yes	Yes	Yes
WIRELESS LAN	Antenna	Antenna	Antenna	Antenna	Intel 802.11b
WARRANTY	1 year	1 year	1 year	1 year	1 year
OP SYSTEM	Windows® XP Pro	Windows® XP Pro	Windows® XP Pro	Windows® XP Pro	Windows® XP Pro
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Pocket PC e750

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- Intel PXA255 400MHz Xscale
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MOBILE PENTIUM M	1.0GHz	-	1.2GHz
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HARD DRIVE	40GB	40GB	60GB
SCREEN	12.1" XGA	12.1" XGA	12.1" XGA
56K v.90 & 10/100 LAN	Yes	Yes	Yes
WIRELESS LAN	Intel 802.11b	Yes	Intel 802.11b
OPTICAL DRIVE	No	No	Combo
WEIGHT	1.1kg	1.8kg	1.9kg
OP SYSTEM	Windows® XP Pro	Windows® XP Tablet	Windows® XP Pro
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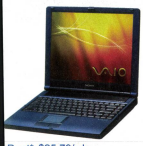
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- **DVD-RW Drive**
- 40GB HDD
- 256MB RAM
- 32MB Video Memory
- USB 2.0

Rent* $36.71/wk
(J4638) **$3,699**

PCGZ1RGP



- Pentium M 1.5GHz
- 14.1" SXGA Display
- DVD/CD-RW Drive
- **Integrated Wireless LAN**
- XP Pro
- 512MB RAM
- 60GB HDD

Rent* $42.56/wk
(J8822) **$4,499**

PCGV505GP



- Pentium 4 2.2GHz-M
- 12.1" XGA Display
- DVD/CD-RW Drive
- **Integrated Wireless LAN**
- XP Pro
- 512MB RAM
- 40GB HDD

Rent* $37.83wk
(J4639) **$3,999**

PCGGRT30P



- Pentium 4 2.8GHz
- 16.1" UXGA Display
- **DVD +/- RW Drive**
- Integrated Wireless LAN
- XP Pro
- 512MB RAM
- 60GB HDD
- 64MB Video Memory

Rent* $55.36/wk
(J8821) **$5,999**

All VAIO models feature 56K modem, 10/100 LAN, i.LINK, USB and a full suite of multimedia software (including Photoshop Elements and Symantec Norton AntiVirus).

PEGSJ22G



- Palm OS 4.1
- DragonBall VZ 33MHz
- 320 x 320 Colour Display
- 16MB Memory

(H9982) **$449**

PEGSJ33G



- Palm OS 4.1
- Dragonball VZ 66MHz
- 320 x 320 Colour Display
- 16MB Memory
- ATRAC3/MP3 Audio Playback with earphones

Rent* $6.71/wk
(H0804) **$599**

PEGTG50G



- Palm OS 5.0 • Intel PXA250 200MHz
- 320 x 320 Colour Display • Integrated Bluetooth™ • Integrated Keyboard with Illumination
- Voice Record Function
- ATRAC3/MP3 Audio Playback with earphones

Rent* $9.51/wk
(H9981) **$849**

PEGNZ90G



- Palm® OS 5.0
- Intel PXA250 200MHz
- 320 x 480 Display
- 2.0 Megapixel Camera
- Integrated Bluetooth™
- Wireless LAN Expansion slot
- Integrated Keyboard
- ATRAC3/MP3 Audio Playback with earphones

Rent* $19.04/wk
(H0801) **$1,699**

All Clié models feature memory stick slot, jog dial with back button and a full suite of multimedia software.

PCGAPRV1
Port Replicator for PCGV505P



(I0317)
$490

PCGAPRGT1
Port Replicator for PCGGRT25 and PCGGRT30P



(J9361)
$490

PCGAUFD5
VAIO USB Floppy Disk Drive



(G1047)
$179

PCG-AUMS1AUC
VAIO USB scroll mouse



(A2509)
$119

AUG 7

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IBM

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NEW! ThinkPad Notebooks

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery

Delivery charges extra

IBM

Thinkpad 256MB SDRAM (E4722)
$199

64MB USB 2.0 Memory Key (I0304)
$104

ThinkPad A & T & X & R Series 72W AC Adapter (A1125)
$110

ThinkPad Port Replicator II (H1821)
$329

ThinkPad Deluxe Leather Carry Bag 01R3605 (F1410)
$165

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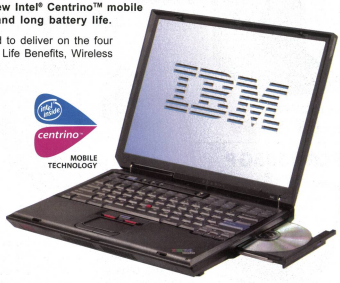
The figures quoted are based on a per week basis over 3 years. T.A.P, Terms & Conditions apply.

NEW! ThinkPad R40 Notebook

The new IBM ThinkPad R40 27229BM with new Intel® Centrino™ mobile technology designed for high performance and long battery life.

Intel® Centrino™ Mobile Technology is designed to deliver on the four vectors of mobility: Performance Benefits, Battery Life Benefits, Wireless Benefits and Form Factor Benefits.

ThinkPad R40	27229BM
Processor	Pentium-M 1.4GHz
RAM	256MB
Hard Drive	40GB
Screen	14.1" TFT
Optical Drive	DVD/CD-RW Combo
Modem/Ethernet	Yes
Integrated WLAN	802.11b
Security Chip	Yes
Op System	XP Professional
Battery	8 Cell Li-Ion
Warranty	1 year Parts & Labour



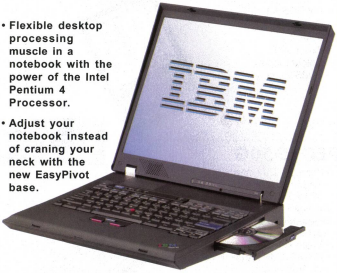
ThinkPad R40 27229BM Rent* $30.75/wk (H2456) **$3,099**

NEW! ThinkPad G40 Notebook

The ThinkPad G Series offers desktop alternative functionality in a ThinkPad notebook for occasionally mobile users who need the flexibility to take work with them. ThinkPad G Series notebooks systems offer high performance and unique comfort features -- all at an affordable price.

ThinkPad G40	23883JM
Processor	Pentium-4 2.4GHz
RAM	256MB
Hard Drive	40GB
Floppy Drive	Yes
Screen	15" XGA TFT
Optical Drive	DVD/ CD-RW Combo
Modem/Ethernet	Yes
Expansion	1 x Parallel, 4 x USB2.0 1 x VGA, Audio, 1 x PC Card Type III
Op System	XP Professional
Battery	12 Cell Li-Ion
Warranty	1 year Parts & Labour

- **Flexible desktop processing muscle in a notebook with the power of the Intel Pentium 4 Processor.**
- **Adjust your notebook instead of craning your neck with the new EasyPivot base.**



ThinkPad G40 23883JM Rent* $27.78/wk (J3517) **$2,799**

AUG 8

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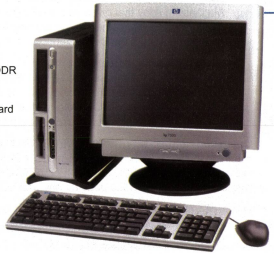
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http://hpstore.ht.com.au

Desktop solution

HP compaq Evo D330 ST

- Intel® Pentium® 2.4 GHz Processor with Hyper Threading (800MHZ FSB)
- Intel® 865G Chipset
- Compact Slim Tower Chassis
- 256MB PC3200 (400MHz) Dual Channel DDR SDRAM (2 x 128MB)
- Integrated Intel Extreme Graphics 2
- 40GB 7200RPM Smart III Ultra ATA/100 Hard Disk Drive
- 48X/24X/48X CD-RW Drive
- 1.44MB Floppy
- Soundmax Digital AC97 Integrated Audio with Internal Speaker
- Integrated Broadcom NeXtreme Gigabit Ethernet
- 6 x USB 2.0 ports (2 Front, 4 Rear)
- 2 x PS/2, 1 x Serial, 1 x Parallel Ports
- USB Easy Access Keyboard
- USB Optical Scroll Mouse
- DMI 2.0 compliant
- Microsoft® Windows® XP Professional
- Norton Anti-Virus 2003



Evo D330 ST

- P2.4GHz
- 40GB
- 256MB
- CDRW
- Win XP Pro.

DL375P#ABG

Monitor not included with Evo D330 ST Desktop

Rent* $15.68/wk (J5275) **$1,399**

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Delivery charges extra

Ask About... Extended Harris Warranty

HP Services Carepaq Upgrades:
Microsoft Operating System Application Telephone Support
10 Call Pack (D6479) **$1,699**
25 Call Pack (D6480) **$4,285**

Server solutions

Improve your business efficiency with an HP server!

HP server tc2120 Series

For businesses setting up their First Client Server Network

- Intel® Pentium® 4 processor 2.66GHz (single processor)
- 256MB standard memory, (4GB max)
- 36GB SCSI harddrive or 40GB ATA
- Integrated single channel Ultra3 SCSI adapter or embedded dual channel ultra ATA-100 IDE Adapter
- Integrated ATI Rage XL Video Controller with 8Mb Video memory
- Up to 5 expansion slots
- 250W Power Supply



tc2120 2.66/533,256MB 40GB ATA — Rent* $18.43/wk (J5323) **$1,645**

tc2120 2.66/533,256MB 36GB SCSI — Rent* $23.77/wk (J5324) **$2,395**

Or purchase a server solution!
A TC2120 SCSI server that is preloaded with windows 2000 Server including 5 Licenses

tc2120 2.66/533,256MB 36GB SCSI W2K bundle — Rent* $35.68/wk (J5327) **$3,595**

HP ProLiant ML330 G3 Server

For businesses needing a **Branch OfficeServer** to run sophisticated small business applications

- Intel® Xeon 2.4GHz or 2.8GHz processor
- 256MB standard memory (4GB max)
- NC7760 PCI Gigabit Server Adapter (embedded)
- 4 PCI expansion slots
- Integrated Single Channel Wide Ultra3 SCSI Adapter in PCI Slot
- 1 year warranty



HP Proliant ML330 G3 2.4GHz 36GB SCSI Model — Rent* $24.76/wk (J2910) **$2,495**

HP Proliant ML330 G3 2.8GHz 36GB SCSI Model — Rent* $28.73/wk (J2912) **$2,895**

Optional Extras 3 year next Business day Onsite Warranty (F1130) **$390**

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Superior Quality and Performance

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NEC Accessories

NEC P Carry Bag
(J9089)
$79

NEC S900 Extender Battery
(J1805)
$349

NEC S900 Port Replicator
(J1803)
$199

NEC S Carry Bag
(G1690)
$69

NEC USB CD-RW Drive
(J7198)
$399

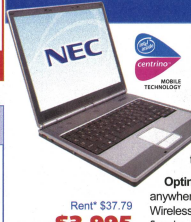
NEC USB Mini Keyboard
(J7205)
$129

NEC T400 Stand
(J7201)
$100

NEC T400 Penset
(J7200)
$100

NEC T Slim Leather Case
(J6986)
$176

NEC Versa P600 - Centrino



NEC VERSA P600 is housed in a glamorous and elegant chassis constructed from Magnesium Alloy that gives you maximum durability without any compromise in design. NEC VERSA P600 comes with a dazzling high resolution 14" display, weighs only 2.4kg and thin, making it the ideal notebook for road warriors.

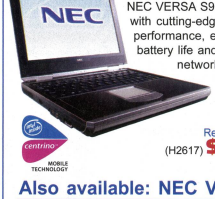
New Technological Powerful Notebook For Executive travellers who require productivity & mobility, the NEC VERSA P600 notebook features the latest Intel® Centrino™ Mobile Technology with Intel® Pentium® M Processor, Intel® 855GM chipset and Intel® PRO/Wireless 2100 Connection that are specially tuned to work together to deliver outstanding mobile performance and extended battery life.

Optimised Connectivity The NEC VERSA P600 allows you constant contact with anyone anywhere in the world thanks to its built-in 56K V.92 Modem, 10/100 LAN, as well as Intel® PRO/Wireless 2100 Connection (802.11b). NEC VERSA P600 is also equipped with one IEEE-1394 firewire port and three USB 2.0 ports for any high speed connection to your peripherals.

Rent* $37.79
(J4675) **$3,995**

• Pentium M 1.4GHz • 14.1" • 40GB • Combo • Wireless • XP Pro

NEC Versa S900 1.5GHz for a true mobile professional



With the latest Intel® Centrino™ Mobile Technology, NEC VERSA S900 comes with cutting-edge notebook performance, extended battery life and wireless networking.

Rent* $42.52/wk
(H2617) **$4,495**

Processor	P-M 1.5GHz, 1MB Cache
Display	12" TFT XGA
RAM	256MB (1024MB Max)
HDD	60GB
Optical Drive	DVD-RW
FDD	External via USB
Video RAM	32MB ATI Mobility Radeon
Touch Pad	Yes
I/O Ports	3 x USB (2.0), 1 x Firewire
Size (mm)	283 x 244 x 34.4 - 35.9
Weight	2.04kg (with weight saver)
OS	Windows® XP Pro

Also available: NEC Versa S900 1.3GHz

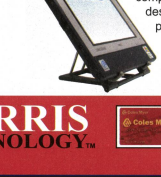


• Intel Pentium M 1.3 GHz, 1MB Cache • 40GB • DVD/CD-RW Combo

Rent* $37.60/wk (H2618) **$3,975**

NEC Versa T400 Tablet PC

NEC Versa® T400™, the industry's thinnest and lightest Tablet PC solution, Engineered to combine the natural convenience of pen-based computing with the productivity advantages of Microsoft's new Windows XP Tablet PC Edition. The Versa T400 represents a new generation of "pure" Tablet-based computing solutions. The T400 is designed for grab-and-go professionals in markets like healthcare and field sales.



Rent* $37.79/wk
(I0321) **$3,995**

Processor	Intel PIII-M 933 MHz Ultra Low Voltage
Display	10.4" XGA TFT LCD
RAM	256MB SDRAM 133Mhz (512MB Max)
HDD	20GB
Optical Drive	USB optional
FDD	USB optional
Size (mm)	15 mm thick
Weight (kg)	1.015kg
Ports	3 x USB 2.0, 1 x Mic-In, 1 x Audio-out, 1 x RJ45, 1 x DC-out for USB devices
Slots	1 x Type I/II CF Card Expansion
Wireless LAN	10/100 Fast Ethernet / 802.11 a/b WiFi
OS	Windows® XP Tablet Edition

AUG
10

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Uncompromising Mix of Power and Style

NEC Versa M320



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Perth, WA
NOW OPEN

Power on Demand

The NEC VERSA M320 offers an uncompromising mix of mainstream power and style, making it ideal for demanding mobile users. From the processor to the video chipset, the NEC VERSA M320 is designed to provide excellent mobile performance. NEC VERSA M320 is equipped with Intel® enhance SpeedStep™ Technology and ATi PowerPlay technology to give longer non-stop operating power.

Maximum Multimedia and Connectivity

NEC VERSA M320 is equipped with both Secure Digital (SD) & Memory Stick (MS) card slot as well as high speed USB 2.0 & IEEE-1394 firewire port that enables you to transfer data with advanced multimedia digital devices. It also features some legacy input-output ports such as parallel port, serial port, PS/2 and so forth that enable you to connect to some of your existing devices. Also includes a built in floppy disk drive.

	224DW	242DW	262DW
Processor	Pentium 4-M 2.2GHz	Pentium 4-M 2.4GHz	Pentium 4-M 2.6GHz
Display	14.1" XGA TFT	15" XGA TFT	15" XGA TFT
RAM 2	256MB DDR	256MB DDR	512MB DDR
HDD	30GB	40GB	60GB
Optical Drive	DVD/CD-RW	DVD/CD-RW	DVD/CD-RW
FDD	1.44MB Internal	1.44MB Internal	1.44MB Internal
Video RAM	ATI Radeon 32MB Shared	ATI Radeon 32MB Shared	ATI Radeon 32MB Shared
Communication	Modem, LAN	Modem, LAN	Modem, LAN
Wireless	-	802.11a/b	802.11a/b
Pointing Device	Touchpad and scroll	Touchpad and scroll	Touchpad and scroll
OS	Windows XP Pro	Windows XP Pro	Windows XP Pro
I/O Ports	All have 4x USB 2.0, 1x Parallel, IrDA - Infra red, 1 x Serial, 1 x PS2, 1 x Firewire, Audio, S-Video, 2 x PCMCIA, 1 x VGA, 1 x Memory Card Slot		
Rent	$27.78/wk	$32.74/wk	$37.70/wk
Part Number	(J7594)	(J7597)	(J7599)
Price	**$2,799**	**$3,299**	**$3,799**

DON'T FORGET your Fly Buys points!

Ask About... EXTENDED HARRIS WARRANTY

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Ipex
INFORMATION TECHNOLOGY GROUP

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Reliability, stability & room to grow

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Need to configure a PC to your own needs? Call Harris Technology on 1300 13 9999

The Ipex T200, powered by Intel® Pentium® 4 processor technology, is ideal for the small business user looking for a system with the performance and expansion capabilities to grow and adapt with your needs.

• Ipex T200 XL Altair2 2.66

- Ipex T200 Tower
- **Intel® Pentium® 4 processor 2.66Ghz**
- 256DDRAM DDR PC2100 memory
- 60GB 7200 RPM
- 10/100 Ethernet OnBoard
- USB 2.0 OnBoard
- GeForce4 MX440 64MB with TV Out
- CDRW
- Internal 56K modem
- Wireless Mouse & Keyboard
- **Microsoft® Windows® XP Home**
- OEM Microsoft® Works 7.0
- OEM Symantec NAV
- OEM Nero Burning ROM
- 1year Return to base warranty

With 17" CRT Monitor
Rent* $20.16/wk (J9551) **$1,799**

With 15" TFT Monitor
Rent* $23.52/wk (J9552) **$2,099**



• Ipex T200 XL Altair2 2.80

- **Intel® Pentium® 4 processor 2.80Ghz**
- 512MB DDRDDR PC2100 memory
- 80GB 7200 RPM
- 10/100 Ethernet
- USB 2.0 OnBoard
- GeForce4 MX440 64MB with TV out
- CD-RW/DVD COMBO DRIVE
- Internal 56K modem
- Wireless Mouse & Keyboard
- **Microsoft® Windows® XP Home**
- OEM Microsoft® Works 7.0
- OEM Symantec NAV
- OEM Nero Burning ROM
- 1year Return to base warranty

With 17" CRT Monitor
Rent* $24.60/wk (J9555) **$2,195**

With 15" TFT Monitor
Rent* $24.76/wk (J9556) **$2,495**



• Ipex T200 XL Altair2 2.80

- **Intel® Pentium® 4 processor 2.80Ghz**
- 512MB DDRDDR PC2100 memory
- **120GB 7200 RPM**
- 10/100 Ethernet OnBoard
- USB 2.0 OnBoard
- GeForce4 Ti4200 128MB with TV out
- **Sony DVD -/+ RW**
- Internal 56K Modem
- Wireless Mouse & Keyboard
- **Microsoft® Windows® XP Home**
- OEM Microsoft® Works 7.0
- OEM Symantec NAV
- OEM Nero Burning ROM
- 1year Return to base warranty

With 15" TFT Monitor
Rent* $29.72/wk (J9558) **$2,995**



• Ipex Convergence™ XL

- **Intel® Pentium® 4 processor 2.40GHz**
- 256MB DDR RAM
- 40GB HDD 7200RPM
- CD-ROM
- Integrated Intel Extreme Graphics Onboard
- Sound Onboard
- 10/100 LAN Onboard
- USB 2.0 Onboard
- Ipex Mouse & keyboard
- 3.5" 1.44MB Floppy drive
- **Microsoft® Windows® XP Professional**
- OEM Symantec NAV
- 3 Years Return to base Warranty

With 15" TFT Black Monitor
Rent* $21.28/wk (J0475) **$1,899**



• Ipex Dualine XL 15"

- **Intel® Celeron® processor 2.50GHz**
- 512MB PC2100 DDR memory
- 30GB hard drive
- Integrated LAN
- 32MB onboard video
- 15" TFT
- Integrated sound
- CD-Rom
- 56K integrated modem
- **Microsoft® Windows® XP Home**
- 1 year return to base warranty
- **Optional Battery not Included**

Rent* $21.28/wk (J9562) **$1,899**



Ipex recommends Microsoft® Windows® XP.

Ipex CentraNAS 320

(Network Attached Storage) Appliance



HARD DISK (7200RPM) 8 x 40GB

RAW CAPACITY 320GB

CAPACITY - Raid 5 + Hot Spare Drive 240GB

Rent $43.51/wk

(J2711)

$4,599

AUG 12

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APC®
Legendary Reliability®

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Power Back Up = Power Protection

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Back-UPS ES 350/500

Affordable battery backup

IDEAL FOR: computer & data, fax photocopier, modem internet, printer scanner

APC Back-UPS ES 350/500 is an affordable battery backup to provide continued uptime and hardware protection for home and home office. Three battery and surge, two surge only outlets, phone, modem, fax and DSL data line surge protection, computer interface port for USB communications and ships with file saving and auto-shutdown software. 2 year warranty.

$150,000 Lifetime Connected Equipment Protection!



Back-UPS ES 350va	(E1093)	$219
Back-UPS ES 500va	(E0709)	$275

Back-UPS RS for Workstations

Smart battery backup & high performance surge suppression

IDEAL FOR: computer & data

Including additional outlet for protection of printers, audible alarms, phone/modem protection, user replaceable hot swappable batteries. PowerChute® Plus software.



APC Back-UPS RS 500VA (H2003)		$339
APC Back-UPS RS 1000VA Rent* $8.95/wk	(J5134)	$799

Smart-UPS with USB Support

Smart-UPS 1000VA, 1500VA

IDEAL FOR: computer & data

Smart-UPS protects your data by supplying network-grade battery backup when power fails. PowerChute® Plus software will safely store data and shut down your network operating system before the battery is fully discharged. APC Smart-UPS is the perfect UPS for fileservers, minicomputers, Internet hubs, telecom systems and other mission-critical applications.



APC Smart-UPS 1000VA Rent* $11.04/wk	(D9337)	$1,149
APC Smart-UPS 1500VA Rent* $14.85/wk	(D4218)	$1,495

Smart-UPS Rackmount

Smart-UPS 750VA, 1000VA

IDEAL FOR: servers

APC's slim line rack-mount Smart-UPS deliver premium uninterruptible power and the most advanced performance features available. With PowerChute® plus software the uninterruptible power supply (UPS) will safely store data and shut down your network operating system before the battery is fully discharged, whether you're there or not. SmartSlot internal accessory slot allows you to install optional accessories to enhance the performance of your UPS.



APC Smart-UPS 750VA Rent* $13.75/wk	(H0659)	$1,225
APC Smart-UPS 1000VA Rent* $12.92/wk	(H0660)	$1,599

APC



PNote Pro (99592)
$59



Surge Arrest 5 Strip (A0098)
$69



APC Symmetra Power Array 8kVA, exp. to 16kVA (71087)
Rent*$119.44wk
$14,799

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WatchGuard

HT Web Direct
www.ht.au/cat/watchguard

WatchGuard Network Security

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Collect 5000 Bonus FlyBuys Points when you purchase J7935, J7936 & J7937 between 20/07/03 31/08/03

HARRIS TECHNOLOGY.

WatchGuard Firebox Vclass

ASIC based Firewall and VPN Appliances, featuring: VLAN,QOS and Server Load Balancing



WatchGuard® Firebox® Vclass brings high-speed ASIC-based network security to enterprise-class businesses, remote offices, service providers and data centers.

For more information Call Harris Technology

AUG 14

WatchGuard FIREBOX SOHO 6 WIRELESS

- 75Mbps firewall and 20Mbps VPN (3DES)
- Five 10/100 Fast Ethernet ports
- Remote management with Branch Office
- 3DES encryption, authentication, & IPsec VPN
- Anti-Virus and Content Filtering
- Includes 90-day LiveSecurity Service

Now, with a single appliance, you can protect both your wireless and wired networks. The WatchGuard® Firebox® SOHO 6 Wireless is an economical, high-performance, wireless Firewall, VPN and broadband-sharing appliance. Designed for small businesses requiring network security, the Firebox SOHO 6 Wireless eliminates wireless vulnerability, allowing employees and telecommuters to enjoy the independence of wireless.



WatchGuard FireBox SOHO 6 Wireless
- 10 User — Rent* $14.51/wk (J7935) **$1,295**

WatchGuard FireBox SOHO 6tc Wireless
- 10 User + VPN — Rent* $17.65/wk (J7936) **$1,575**

WatchGuard FireBox SOHO 6tc Wireless
- 50 User + VPN — Rent* $24.53/wk (J7937) **$2,189**

WatchGuard FIREBOX SOHO 6 & WatchGuard Firebox III

Stand alone or Branch Office Firewall Appliances

- Excellent firewall and VPN performance at a great price.
- Dedicated security applainces that are easy to install and manage.
- Superior VPN support with IPSec branch office and remote user VPN functionality.
- Hardware expandability and new optional port for Branch Office VPN tunnel segregation and secure wireless access or dual ISP failover.

Feature rich Firewall and VPN Appliances

- Great value richest security features in the SME market, including firewall protection proxies.
- Easy to deploy rapid installation with quick Setup Wizard and intiutive management interface.
- Simplified Administration Drag-and-Drop VPN creation, real-time monitoring, and traffic trend analysis.
- Certified technology ICSA compliant firewall and IPSec VPN technology.

FIREBOX SOHO 6



SOHO 6
Rent* $10.48/wk
(G5584) **$935**

FIREBOX SOHO 6 TC



SOHO 6 tc 10 user Branch Office VPN with IPSEC
Rent* $14.00/wk
(G5585) **$1,249**

FIREBOX SOHO 6 TC 50 User



SOHO 6 tc - 50 User + Branch Office VPN
Rent* $21.24/wk
(I0094) **$1,895**

FIREBOX III 500



WatchGuard Firebox III 500
Rent* $35.00/wk
(J2169) **$3,527**

FIREBOX III 700



WatchGuard Firebox III 700
Rent* $44.23/wk
(D3866) **$4,675**

FIREBOX III 1000



WatchGuard Firebox III 1000
Rent* $72.09/wk
(D3789) **$8,099**

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Overland STORAGE

RENTSMART
*The figures quoted are based on a per week basis over 3 years. T.A.P. Terms & Conditions apply.

HT Web Direct
www.ht.com.au/cat/overland

Next Generation Backup Solutions

LoaderXpress

- DLT1, DLT8000, SuperDLT - up to 1.1TB, 10 Cartridges
- LTO 1 & 2 Ultrium - up to 4.4TB, 11 Cartridges.

The LoaderXpress is a family of autoloaders which combine the latest drive technology with field-proven and award winning robotics first introduced by Overland. This line is an excellent entry point for users who require tape automation on a modest budget. LoaderXpress products support the LATEST in tape technology.

LXLS810ST Single DLT8000 Drive
Rent* $83.66/wk (F3150) **$9,978**

LXL1S10T Single SuperDLT 220 BRC Drive
Rent* $168.13/wk (B6370) **$20,898**

LXL1U11T Single LTO Ultrium Drive
Rent* $163.80/wk (E6376) **$20,360**

LXL2U11T Single LTO 2 Tape Drive
Rent* $186.45/wk (J5823) **$23,175**

PowerLoader

- DLT1, DLT8000, SuperDLT-up to 1.7TB, 15 or 17 Cartridges
- 1-2 drives, field-upgradeable, barcode reader standard.
- Now Available: LTO 1 and LTO 2

Overland PowerLoaders offer a step up in capacity and performance at a minimal cost for users who may currently use a standalone tape drive or small autoloader and now need more performance. Overland offers a series of autoloaders that can be field upgraded to two drives. The PowerLoader offers the most popular drive technologies ensuring that existing tape media archives can be read.

LXM1L117TB Single LT0 Tape Drive 17 tape capacity
Rent* $172.17/wk (H0638) **$21,400**

LXM8115TB Single DLT8000 Tape Drive 15 tape capacity
Rent* $111.58/wk (F3171) **$13,765**

LXM2S115TB Single SuperDLT 320 BRC Drive 15 tape capacity
Rent* $181.17/wk (H9768) **$22,519**

LXM2L117TB Single LTO-2 Tape drives 17 tape capacity
Rent* $188.95/wk (J4736) **$23,486**

AIT PowerLoader

- AIT-2, AIT-3 drives – 950GB, 1900GB, 19 Cartridges plus mail slot
- 1 or 2 drives – field-upgradeable, bar code reader standard.



LP2L119TB Single AIT-2 Tape Drive
Rent* $121.51/wk (F3177) **$14,990**

LP3L119TB Single AIT-3 Tape Drive
Rent* $157.44/wk (F3179) **$19,569**

Neo Series 2000

- DLT8000, SuperDLT, LTO Ultrium – up to 6TB
- 1 or 2 drives – field–upgradeable
- 26 (DLT8000, SDLT) or 30 (LTO) cartridges.

The Neo series is the newest library family from Overland and it provides unprecedented levels of availability through Non-Stop Operation, investment protection through SmartScale Architecture, and flexible connectivity to direct attach or SAN environments through Virtual Interface Architecture.



LXN2130R2UL Single LTO-2 Tape Drive
(H9769) **$32,100**

LXN2126T1SL Single SDLT220 Tape Drive
Rent* $231.70/wk (F3182) **$28,799**

LXN2126T2SL Single SDLT320 Tape Drive
(F4315) **$30,695**

LXN2130T1UL Single LTO-1 Ultrium Tape Drive
Rent* $233.11/wk (F3185) **$28,975**

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery

Delivery charges extra

MEDIA

DLT Tape Media IIIXT 15/30GB Tape
(68362)
$79

DLT Tape IV Media 20/ 80GB
(71231)
$125

DLT Cleaning Tapes
(97851)
$83

Super DLT Media 110/320 GB
(B9825)
$233

LTO Ultrium 100/200 GB Tape
(D1500)
$128

1 SuperDLT Cleaning Tape
(E4874)
$199

LTO 2 Tape
(J5881)
$285

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OLYMPUS DIGITAL

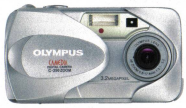
HT Web Direct
www.ht.com.au/cat/olympus

Combining imagination with passion

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery

Delivery charges extra

C-350



- 3.2 Megapixel
- 3 x Optical Zoom
- Ultra-compact Design
- Scene Programs
- 1.8 inch LCD Monitor
- Ultra Compact Removable xD-Picture Card

Rent* $6.66/wk

(H9717) **$595**

C-740



- 10x Ultra Zoom • 3.18 million pixels
- Bright zoom lens F2.8/3.7
- Electronic Viewfinder • Histogram in shooting and playback mode
- S-macro (from as close as 3cm)
- xD-Picture Card compatible
- QuickTime motion JPEG • USB AutoConnect • Video interface

Rent* $11.15/wk

(H9718) **$995**

C-50



- 5 Megapixel
- Ultra-bright 3x Optical Zoom
- Accepts xD cards
- A professionally featured camera in the compact class.
- USB AutoConnect
- Includes drawstring pouch

Rent* $13.39/wk

(G5486) **$1,195**

xD Picture Cards

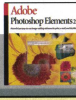


64MB (H2543) **$79**

128MB (G4747) **$146**

256MB (H2445) **$265**

512MB (J9026) **$519**



BONUS..... Adobe Photoshop Elements with every Olympus digital camera

RENTSMART

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SimpleTech

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Memory Solutions & Technology

SimpleTech Secure Digital



Don't just save your data, secure it with SimpleTech Secure Digital cards. Features a write protect switch on the side of the card. Also features cryptographic security for copyrighted data based on Secure Digital Music Initiative portable device requirements. Is designed for unlimited compatibility with digital cameras, music players, and other devices that use Secure Digital (and MultiMedia Card).

- **Lifetime warranty, Secure Digital Card Range.**

32MB	(G9385)	**$59**
64MB	(G9390)	**$79**
128MB	(G9395)	**$134**
256MB	(H0296)	**$235**
512MB	(H5011)	**$779**

SimpleTech Bonzai USB Mini-Drive



An expandable, pocket-size USB storage device for your personal files. Use to store, transfer and carry your business documents, including Microsoft PowerPoint, Excel and Word files, to work anywhere you travel. Carry favorite digital pictures, MP3 music, video and audio clips to share with family and friends. Even store games for a little fun between projects.

- **SD or MMC flash card expandable**
- **USB interface**
- **1.5MB/second transfer rate.**

64MB	(G9372)	**$109**
128MB	(G9373)	**$185**
256MB	(G9374)	**$269**

SimpleTech USB Flash Drive



SimpleTech's new USB Flash Drive is a small, portable, and convenient replacement to floppy disks, CD s, and more. One 256MB USB Flash Drive offers as much storage capacity as up to 177 standard floppy disks.

- **Slim, convenient design with keyring attachment**
- **USB interface: plug and play, hot swap functions**
- **1.5MB/second transfer rate**
- **LED indicates drive is in use**
- **No external power required**
- **No cables or adapters required**
- **Windows 98SE/ME/2000/XP; MacOS 8.6**

128MB	(J9079)	**$88**
256MB	(J9080)	**$163**

Now you can collect Fly Buys points when you purchase from HARRIS TECHNOLOGY.

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LOGITECH

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Cordless and Optical Combinations

Logitech Navigator Trio

Logitech Navigator Trio is the complete communication solution for your PC.
The comfortable ultra-flat cordless keyboard features enhanced function keys to simplify the things you do most often. Gain one-touch access to your QuickCam camera; easily control your multimedia experience; quickly access your files, pictures, music and the Web. The cordless optical mouse provides greater accuracy on almost any surface. The included Logitech QuickCam Messenger is an easy-to-use webcam with a built-in microphone.



(G9642) **$197**

QuickCam® Pro 4000

This premium webcam lets you express your creativity like a pro.
Capture, edit and share high-quality videos, up to 1.3 megapixel photos and add video to your instant messages.
2-year warranty.



(F8835) **$227**

Cordless MX Duo™



Ultimate performance, design and control.
The ultra-comfortable Cordless Elite Keyboard delivers high performance cordless freedom, maximum efficiency and innovative style. The cordless MX-700 Optical Mouse integrates a revolutionary optical sensor with fast RF cordless technology to provide corded performance - without the cord. With rechargeable batteries and a rapid charge base unit the mouse is always ready to use.
5-year warranty.

(H9665) **$197**

Cordless Presenter

Powerful, cordless control for your presentations in a convenient two-button design.
EmphasiSe your key points with the built-in laser pointer. Move a switch and your presenter becomes a cordless optical mouse. Cordless Presenter incorporates advanced Bluetooth technology for exceptional reliability and a 10-m (30-foot) range. Includes a carrying case and a 5-year guarantee.



(E4364) **$379**

Logitech® Z680 THX Speakers

The Logitech Z-680 THX is a 500 Watt sound system with built-in Dolby Digital and DTS hardware decoding.
Advanced functionality includes Dolby Pro Logic II for 5.1 surround sound from stereo sources. Optical and coaxial inputs allow simple connection to nearly any audio appliance including PCs, TVs, game consoles, CD & DVD players. The Z-680 is all you need to turn your existing audio or video system into a home theatre.
2-year warranty.



(G2817) **$695**

Logitech® Z340 Speakers

The Logitech Z-340 is a 33-watt, 2.1 speaker system that produces superior stereo sound.
A revolutionary subwoofer delivers twice the bass power of similar systems. The innovative satellites can either stand on the desk or be wall-mounted and feature a convenient headphone jack and volume control. 2-year guarantee.



(E1070) **$99**

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Delivery charges extra

Logitech

QuickCam® for Notebooks Pro



(G2810) **$219**

Premium Stereo Headset



(H8682) **$40**

QuickCam Express



(D5894) **$85**

Access Keyboard



(F7292) **$38**

Optical Mouse

optical



(B9948) **$45**

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Fax: 1300 13 6666 **Email:** sales@ht.com.au

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D-Link®

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Networking Solutions

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Wireless Antennae

DWL-50AT Omni directional indoor antenna upto 500M (F5424) **$38**

DWL-M60AT Directional Indoor antenna upto 500M (F5427) **$113**

DWL-R60AT Directional Indoor antenna upto 500M (G2082) **$56**

ANT24-0401 Omni-directional Indoor ceiling mount antenna upto 500M (G5591) **$218**

ANT24-0800 Omni-directional Outdoor Antenna upto 1Km (F4219) **$245**

ANT24-0801 Directional Outdoor Antenna upto 1Km (F4220) **$249**

ANT24-1400 Directional Outdoor Antenna upto 3Km (F5426) **$349**

ANT24-2100 Directional Outdoor Antenna upto 10Km (J5344) **$537**

High Quality Video Conferencing for Home and Office

BONUS

DVC-1000 VideoPhone

The D-Link DVC-1000 VideoPhone introduces the world of video conferencing over the Internet, to bring you and your family, friends and colleagues together. Since the DVC-1000 VideoPhone is a stand-alone device, you do not need a computer to video conference over the Internet. Compatible with Net Meeting or any product that supports Net Meeting.



BUY A DVC-1000 VIDEO PHONE AND RECEIVE A **DSL-500 ADSL MODEM ROUTER FREE.** (Bundled)

EXCLUSIVE TO HARRIS TECHNOLOGY FROM 01-30 AUGUST 2003

Rent* $8.91/wk (H2334) **$795**

AirPlus XtremeG™ 11/54Mbps Wireless Solutions

AirPlus XTREME G

New series of high-speed devices capable of transfer rates up to 54Mbps. And with the new AirPlus Xtreme G DWL-2000AP Wireless Access Point, D-Link once again sets a new standard for wireless access points.
It includes an embedded DHCP server that once enabled will automatically assign IP addresses to wireless clients. This unique feature makes the DWL-2000AP an ideal solution for quickly creating and extending a wireless local area network (WLAN) in offices or other workplaces, or even at trade shows and other special events.



DWL-G520 Wireless PCI adapter (H9622) **$169**



DWL-G650 Wireless PCMCIA cardbus (H9621) **$139**



DWL-2000AP Wireless Access Point (H9623) **$320**



DI-624 (J4539) **$339**

The DI-624 features the very latest in advanced wireless silicon chip technology including enhanced security to shield and protect your wireless communication from intruders. It also includes D-Link's own robust firewall security features. The DI-624 is ideal for those creating their first wireless network, as well as for more advanced users looking for additional management settings and policy-based content filtering. Filters can be set based on MAC address, IP address, URL and/or Domain Name.

22Mbps Wireless Network

DWL-650+ AirPlus™ 22 Mbps Wireless LAN PCMCIA adapter



(F5422) **$95**

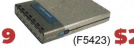
DWL-520+ AirPlus™ 22 Mbps Wireless LAN PCI Adapter



(F5421) **$119**

DWL-900AP+ AirPlus™ 22 Mbps Wireless LAN Access Point

AirPlus



(F5423) **$229**

Cable & DSL Routers/Gateways & Modems

DSL-302G USB/Ethernet Combo ADSL Modem - with NAT+ DHCP (J2428) **$229**



DSL-300+ External ADSL Ethernet Modem with a single 10Mbps Ethernet Port (G2081) **$219**

DSL-604+ Wireless ADSL Router, all-in-one networking device that provides broadband Internet connection, wireless user access and dedicated LAN bandwidth server connection.



(G8729) **$499**

DI-614+ AirPlus 22Mbps Wireless IP router for Cable & DSL modems with 22Mbps wireless access point and 4 Port 10/100 switch (G0229) **$239**



DI-714P+ 22Mbps Wireless IP Router for DSL/Cable Modems with 4 Port Switch & Single Port Print Server (G9644) **$379**

DI-764 11/22/54Mbps Wireless IP Router for DSL/Cable Modems with 4-Port Switch Rent* $10.07/wk (G9645) **$899**



DI-704P IP Router for DSL/ Cable Modems with 4 Port Switch & Single Port Print Server

Built-in Bigpond Cable Login

(E5861) **$159**

DI-707P IP Router for DSL/Cable Modems with 7 Port Switch & Single Port Print Server

Built-in Bigpond Cable Login

(E7329) **$229**

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Products on Promotion

10/100Mbps Desktop Switches

DES-1005D
The D-Link DES-1005D is a powerful desktop, 5 Port 10/100 auto-negotiating switch

(85101) **$89**

DES-1008D
The D-Link DES-1008D is a powerful desktop, 8 Port 10/100 auto-negotiating switch



(98254) **$125**

DES-1016D
16-Port 10/100Mbps Fast Ethernet Unmanaged Switch (Including rackmount kit)

(F0915) **$229**

DES-1024D
24-Port 10/100Mbps Fast Ethernet Unmanaged Switch (Including rackmount kit)



(G1783) **$417**

10/100Mbps Rackmount Switches

DES-1016R+
16 Port 10/100 Unmanaged switch with Optional Fibre module

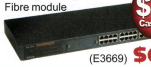
$50 CashBack



(D4164) **$427**

DES-1024R+
24 Port 10/100 Unmanaged switch with Optional Fibre module

$50 CashBack



(E3669) **$649**

DES-1218R
16-Port 10/100Mbps Unmanaged Switch with optional Gigabit/ Fibre Modules

$50 CashBack

(E7773) **$709**

DES-1226R
24-Port 10/100Mbps Unmanaged Switch with optional Gigabit/ Fibre Modules

$50 CashBack

(E7388) **$828**

DES-1026G
24 Port 10/100 Unmanaged switch with 2 x built in gigabit ports

$50 CashBack



(H1560) **$984**

10/100/1000 Gigabit Switches

DGS-1004T
4 Port 10/100/1000 Unmanaged gigabit switch

(G3818) **$619**

DGS-1008T
8 Port 10/100/1000 Unmanaged gigabit switch



(D9338) **$999**

DGS-1016T
16 Port 10/100/1000 Unmanaged gigabit switch

(G3825) **$2,595**

DGS-1024T
24 Port 10/100/1000 Unmanaged gigabit switch with 2 Combo Mini-GBIC ports

(G1968) **$3,290**

Managed Switches

DES-3226S
24 Port 10/100 Layer 2 Managed, Stackable Switch with Optional Gigabit/Fibre modules



(F9634) **$1,479**

DES-3250TG
48 Port 10/100 Layer 2 Managed switch with 2 Mini-GBIC ports



(G5974) **$2,355**

DES-3326S
24 Port 10/100 Layer 3 Managed, Stackable Switch with Optional Gigabit/ Fibre modules



(G3828) **$3,595**

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery

Delivery charges extra

IT & T AWARDS
RESELLER OF THE YEAR
2002

Redemption details

$50 CashBack

Only available on selected marked items Part No# D4164,E3669, E7773, E7388, H1560 Valid from 01 August until 30 September 2003 The following must be sent to D-Link, no later than the 15 October 2003
- The sticker from the box
- Original or photocopy of the store receipt
- The barcode from the bottom of the box (Cut out)
- Name, address, phone number, email and address

Sent to D-Link Cash Back Offer
1 Giffnock Ave
North Ryde
NSW 2113

Terms & Conditions apply

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AUSTRALIA CONNECTS WITH NetComm®

20 years

HT Web Direct
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High Speed Internet Access

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Delivery charges extra

IT & T AWARDS
RESELLER OF THE YEAR
2002

EM1100R Inline microfilter





(J7634)
$19

Print Server



NP5300PS
10/100Mbps print server, 3 parallel ports

(92346)
$398

HARRIS TECHNOLOGY
Perth, WA
NOW OPEN
AUG 20

ADSL Modems with NetComm

NB1300 (USB/Ethernet) ADSL Modem router

High speed ADSL modem with both Ethernet & USB connectivity. Fully featured NAT router. Approved for connection to Telstra's ADSL network.

New Features:
- SNMP
- Telnet
- Three step one page setup



(G4025) **$199**

NB1200 ADSL USB Modem

High Speed ADSL modem with USB connectivity. Approved for connection to Telstra's ADSL network.



(F8602) **$129**

NB3300 ADSL Modem / Router / 4-port switch

Integrated ADSL modem and router with 4 port 10/100 switch.
- Easy web interface
- NAT security and internet sharing
- Supports PPPoA, PPPoE, PPTP



(F3590) **$379**

NetComm Cable / ADSL Routers

NB2800 Cable / ADSL Router / 4-port switch

- Built-in DHCP server
- NAT firewall protection
- VPN pass-through
- Quick & easy to install



(H2086) **$149**

NB3000 Cable / ADSL Wireless Router / 4-port switch

- 4-port 10/100 switch
- NAT firewall protection
- Wireless range up to 90 metres indoors!
- Works with major Australian ISP's - Cable, ADSL.

Wireless speeds and range may vary depending on locations.



(F3588) **$269**

NB3100C Broadband Firewall Router with 10/100 4 port switch

New features include:
- Active SPI & DOS Firewall
- Now supports 5 VPN end points
- Universal Plug & Play
- Can block all Java, ActiveX code and cookies
- IPSec and PPTP pass-through
- 4-port 10/100 switch
- UPnP (Universal Plug & Play)
- Diagnostics (Ping & Trace Route)
- Back up & Restore Configuration

HOT NEW PRODUCT



(J4636) **$255**

NB3200 Cable / ADSL VPN Router 4-port switch

- Provides full IPSec VPN tunnelling and NAT firewall protection
- Supports up to 70 simultaneous VPN tunnels
- 4-port 10/100 switch
- Easy web interface



(F3586) **$389**

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AUSTRALIA CONNECTS WITH NetComm®

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Wireless Solutions

NetComm 11g-54Mbps Wireless Networking

Designed around the recently ratified IEEE 802.11g standard for Wireless Networking, NetComm's new range of Wireless Networking products deliver transfer rates of up to 54Mbps while maintaining backwards compatibility with earlier 802.11b-11Mbps wireless systems. Incorporating the latest developments in wireless technology, NetComm has ensured your data will always be secure with 128-bit WEP encryption and MAC Address Authentication*. NetComm products are designed and engineered in Australia for Australian conditions and are backed by our 20 years of experience in delivering communication solutions to the Australian market.

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery

Delivery charges extra

NP5400 - 11g-54Mbps Wireless Access Point



- Scorching transfer rate of up to 54Mbps with auto-fallback for 11b systems.
- Flexible Integration for Infrastructure and Client modes.
- Data security with the latest 128-bit WEP encryption & MAC Address Authentication.
- Removable antenna for greater installation flexibility.

NEW

(J8479) **$319**

NP5430 - 11g-54Mbps Wireless PC-Card



- Scorching transfer rate of up to 54Mbps with auto-fallback for 11b systems.
- 32-bit CardBus technology.
- Data security with the latest 128-bit WEP encryption.
- Low power consumption design.

NEW

(J8480) **$149**

NB5540 - 11g-54Mbps Wireless Firewall Router



- Scorching transfer rate of up to 54Mbps with auto-fallback for 11b systems.
- Enhanced Security Firewall - SPI, DOS and URL filtering.
- 5 simultaneous Endpoint VPN Tunnels.
- ADSL/Cable Router with 4 Port 10/100 Switch.
- UPnP, Diagnostics, Backup & Restore configuration.
- Easy Web based configuration.

NEW

(J8540) **$319**

NetComm 11b-11Mbps Wireless Networking

NP6800 Wireless Access Point

NetComm 11Mbps Wireless LAN Access Point

- Client, Point & MultiPoint Bridge modes • Security with the latest 128-bit WEP encryption
- Auto fallback = optimised reliability, throughput and transmission range



HOT PRICE

(H2189) **$169**

NP7032 Wireless PC Card

Provides high speed wireless networking and secure access to network resources and the internet.



HOT PRICE

(H2060) **$69**

NP7042 Wireless USB Adaptor

Provides high speed wireless Internet access and networking for USB-enabled desktop PCs or notebooks.



HOT PRICE

(H2064) **$99**

NetComm Ethernet Switches and Gigabit Solutions

NP3640 Fast Ethernet Mini Print Server

NEW (J4656) **$209**



Sharing your printer with others on your 10/100 Ethernet network has never been easier than with the NetComm NP3640 Mini Print Server. Fully 10/100 compliant and compatible with most parallel port printers this versatile print server supports 5 major protocols; TCT/IP, NetBEUI, IPX/SPX, SMB and AppleTalk.

NP2005
5 port 10/100 auto-sensing switch

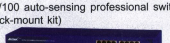


(D0966) **$99**

NP2008
8 port 10/100 auto-sensing switch

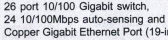
(D0967) **$119**

NP2160
16 port 10/100 auto-sensing professional switch (19-inch rack-mount kit)



(E7322) **$395**

NP2240
24 port 10/100 auto-sensing professional switch (19-inch rack-mount kit)



(E7323) **$489**

NP2480
26 port 10/100 Gigabit switch,
24 10/100Mbps auto-sensing and 2 1000Base-SX Copper Gigabit Ethernet Port (19-inch rack-mount kit)



Rent* $16.70/wk

(F9533) **$1,490**

Fast Ethernet Adaptors

NP1100
32-bit 10/100 PCI LAN Adapter
(C7657) **$19**

NP1200
32-bit 10/100 Ethernet PC Card
(D1166) **$99**

NP1010
USB LAN Key 10/100 Fast Ethernet Adaptor
(C7651) **$68**

NP1300
10base-T Compact Flash LAN Adaptor with PCMCIA adaptor
(D4201) **$129**

NP1800
32-bit PCI Gigabit **Gigabit N.I.C**
(G6483) **$114**

NP1500
32-bit **INTEL** 10/100Mbps network card
(G6482) **$95**

NP1880
32/64-bit PCI Gigabit Network Card **Gigabit N.I.C**
(G6484) **$132**

AUG 21

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NETGEAR™

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Everybody's Connecting

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery

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Managed Switches

These Managed Switches from NETGEAR provide a complete solution with all core components already built in. They provide complete Layer 2 management including SNMP, RMON, VLAN, QoS, Port Trunking, Radius and more. NETGEAR now also offer premium service and support options for businesses.

Next business day exchange warranty FREE with these products see www.netgear.com.au for details



FSM726
24 Ports 10/100Mbps, 2 x copper gigabit ports or 2 x GBIC slots. Rent* $14.10/wk (J2423) **$1,258**

FSM726S
24 Ports 10/100Mbps, 2 x copper gigabit ports or 2 x GBIC slots, non-blocking backplane, stackable.
Rent* $15.35/wk (D8885) **$1,370**

FSM750S 48 Ports 10/100Mbps, 2 x copper gigabit ports or 2 x GBIC slots, non-blocking backplane, stackable.
Rent* $29.36/wk (G4121) **$2,959**



GSM712
10 ports 10/100/1000Mbps switch with 2x GBIC slots.
Rent* $37.00/wk (F4112) **$3,728**

GSM712F
12 port gigabit fibre switch (8 fiber and 4 copper built in, with option to have all 12 fibre). **NEW**
Rent* $49.46/wk (J6553) **$5,360**

GSM7324 layer 3 switch **NEW**
20 x 10/100/10000, 4 GBIC/GTP ports
Rent* $75.42/wk (J6587) **$8,995**

Network Cards

GA302T
Netgear GA302T Copper Gigabit Adapter (D4118)
$72

FA 311
Ethernet Adaptor 10/100Mbps PCI (A1372)
$29

FA511
10/100Mbps CardBus PC Card (No dongle required) (D4112)
$89



Unmanaged Switches

FS726AT
24-Port 10/100 Switch w/Copper Gigabit Module
Rent* $12.87/wk (J6158) **$1,149**

FS750AT
48-Port 10/100 Switch w/Copper Gigabit Module
Rent* $12.87/wk (J6588) **$1,149**

Compact Ethernet Switches

FS105
5 Port 10/100Mbps Ethernet Switch (84722) **$97**

FS108
8 Port 10/100Mbps Ethernet Switch (70905) **$146**

FS116
16 Port 10/100Mbps Ethernet Switch (A5347) **$209**

Rackmount Ethernet Switches

FS516
16 Port 10/100Mbps Ethernet Switch (60522) **$482**

FS524
24 Port 10/100Mbps Ethernet Switch
Rent* $7.27/wk (77549) **$649**

10/100 Switches

JFS516
16 Port 10/100 Mbps Fast Ethernet Switch (J4793) **$343**

JFS524
24 Port 10/100Mbps Ethernet Switch (H5214) **$437**

Gigabit Switches

These unmanaged gigabit switches from NETGEAR provide lightening fast 10/100/1000 connections. All ports are automatic speed and full/half duplex sensing.

Next business day exchange warranty FREE with these products see www.netgear.com.au for details

GS104
4 Port 10/100/1000Mbps gigabit switch.
Rent* $8.11/wk (F7306) **$724**



GS108
8 Port 10/100/1000Mbps gigabit switch.
Rent* $10.07/wk (H1741) **$899**

GS516T
16 port 10/100/1000Mbps gigabit switch.
Rent* $22.20/wk (D5960) **$2,237**



GS524T
24 Port 10/100/1000Mbps gigabit switch.
Rent* $29.87/wk (D5961) **$3,010**



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Wireless Solutions

Firewall and VPN Routers

NETGEAR offer a complete range of ProSafe firewall routers which include SPI, DoS, logging and reports and alerts. All routers support VPN passthrough, content filtering and VPN endpoint termination is available on certain products.

RP614 Cable/DSL Web Safe Router with 4 x 10/100 Mbps switch (F9645) **$149**

Hot Product

RP614



FR114P Cable/DSL ProSafe firewall router, print server, 4 x 10/100 switch, ICSA Certified. (F0902) **$215**

FVS318 Cable/DSL ProSafe firewall router, 8 VPN tunnels, 8 x 10/100 switch (F0242) **$285**

FM114P Cable/DSL ProSafe Wireless router, 802.11b access point, print server, 4 x 10/100 switch (F0904) **$364**

FM114P



FR328S Cable/DSL ProSafe firewall router, serial port for automatic fail over, 8 x 10/100 switch (G6240) **$369**

FWAG114 ProSafe 54 Mbps a/b/g Wireless VPN Firewall with 4 x 10/100 switch Rent* $7.82/wk (J4686) **$698**

FVL328 Cable/DSL ProSafe firewall router, 100 VPN tunnels, 8 x 10/100 switch Rent* $11.10/wk (G8576) **$989**

FVM318 Cable/DSL ProSafe firewall, 802.11b Wireless access point, upto 102 VPN tunnels over WLAN and WAN, 8 x 10/100 switch Rent* $18.20/wk (G8578) **$1,624**

FVM318



Wireless Solutions

NETGEAR's wireless products supports 54 Mbps 802.11g* and 802.11b as well as 802.11a ensuring the maximum freedom of movement, flexibility and maximum throughput in all situations.

11 Mps

MA521
11Mbps 802.11b wireless PC card (J4550) **$105**

MA111
802.11b Wireless USB Adapter (H9137) **$129**

MR814
DSL Router 11Mbps 802.11b Cable (H1735) **$229**

54 Mps

WG511
11/ 54Mbps wireless PC card (H9581) **$145**

WG311
11/ 54 Mbps Wireless PCI Card (J8554) **$168**

WGE101
11/ 54 Mbps Wireless Ethernet bridge (J8566) **$225**

WAG511
11/ 54Mbps a/b/g tri band PC card (H9135) **$245**

WG602
11/ 54Mbps wireless access point (H9579) **$259**

WGR614
11/ 54Mbps Cable/DSL Wireless Router (J2416) **$309**

ANTENNAS Now available!
Check www.ht.com.au for details

MA111



WAG511



WG602



Not all items are in stock at all stores but can be ordered for Pick-up or Delivery

Delivery charges extra

Broadband Access

DG824M
DSL modem router with wireless access point, firewall and 4 port 10/100 switch

(G8580) **$429**

DG814
DSL modem router with 4 port 10/100 switch

(F5181) **$279**

DM602
DSL modem router with USB and Ethernet

(F9650) **$199**

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Enhance Your Notebook

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USB to PS/2 Adapter



UKMC-100 USB to PS/2 Keyboard & Mouse Adapter (B0557) **$47**

USB Bluetooth Adapter



BF-7211
USB to Bluetooth Adapter
(H8797) **$89**

USB Flash Drives



Available from 32MB to 1Gig (see side panel)

USB Flash Storage Drives

- Pocket Size
- True Plug and Play
- Security Zone Feature



UFD-0032
32MB
(G8721)
$49

UFD-0064
64MB
(G8722)
$74

UFD-0128
128MB
(G8723)
$119

UFD-0256
256MB
(G8724)
$195

UFD-0512
512MB
(G8725)
$369

UFD-1000
1GB
(J1849)
$669

USB 2.0 Hubs



USB 2.0 hubs are backward compatible with USB 1.1 products.

UH-422 4 Port USB 2.0 Pocket Hub
(G8675) **$88**

UH-402 4 Port USB 2.0 UFO Hub
(G1938) **$88**

USB Mini Hubs



UH-201M 2 Port USB 1.1 Mini Hub
(G1939) **$28**

UH-401M 4 Port USB 1.1 Mini Hub
(G1940) **$39**



USB to Serial Converter



UMC-100
USB to 9 Pin RS232 Serial Converter
(80782) **$69**

USB 2.0 Docking Station



Includes • 2 x USB 2.0 Ports, • 2 x PS/2 Ports, Printer Port, Serial Port & 10/100 Ethernet.

UDS-102 USB 2.0 Docking Station
(G8691) **$219**

Card Bus Adapters



UCB-402 4 Port USB 2.0 Cardbus
(G4199) **$95**

1394-201 2 port FireWire Cardbus
(G8693) **$69**

USB 2.0 External HDD Enclosures



UHD-2500 USB2.0 to 2.5" HDD
(G8727) **$89**

UHD-3500 USB2.0 to 3.5" HDD
(H8796) **$120**

USB Multi Card Readers



BF-7352 USB 1.1 6-in-1 Card Reader
(J2306) **$63**

BF-6261 USB 2.0 6-in-1 Card Reader
(H8795) **$88**

USB Infrared Adapter



UIR-100 USB to IrDA Wireless Adapter
(D8944) **$90**

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Intelligent KVM Solutions

ServerLink LCD Console Drawers

With a 15" TFT LCD screen, keyboard, touchpad and integrated KVM switch housed in an industry standard 19" 1U-height rack drawer, these LCD KVM switches save you up to 1/3 of valuable rack cabinet space.

INTEGRATED KVM SWITCH

(H2101, H2103) Includes all PS2 VGA cables



LKS-101H	1U Console Drawer 15" TFT LCD, Keyboard & mouse	Rent* $33.83/wk	(H2100)	$3,409
LKS-801H	8 Port KVM - LCD Console Drawer includes all cables	Rent* $37.45/wk	(H2101)	$3,959
LKS-1601H	16 Port KVM - LCD Console Drawer includes all cables	Rent* $42.56/wk	(H2103)	$4,499

ServerLink SOHO KVM Switches



Includes all cables

SL-251-P	2 port KVM inc.2 x 2m cables (E3692)		$199
SL-451-P	4 port KVM inc.4 x 2m cables (E3694)		$299

ServerLink Infinity KVM Switches



On-screen-display

SL-221	2 port ServerLink KVM for PS2	(B3047)		$269
SL-421	4 port ServerLink KVM for PS2	(A9890)		$349
SL-821	8 port KVM	Rent* $10.97/w	(97888)	$979
SL-1621	16 port KVM	Rent* $17.92/w	(97890)	$1,599

Avocent KVM Over IP

These all-in-one 16 port switches combine analogue and IP-based KVM switching for local access from your data centre and REMOTE access from anywhere in the world. Avocent's exclusive KVM over IP switching technology supports multi-platform, multi-location and multi-device installations, all over a standard IP connection.



Supports PC USB & SUN

Avocent



AVR1000	16 Port KVM over IP - 1 Local User & 1 Remote User	Rent* $54.99/wk	(G8455)	$5,959
AVR2000	16 Port KVM over IP - 1 Local User & 2 Remote Users	Rent* $69.66/wk	(G8332)	$7,826
AVRIQ-PS2	AVR Smart Cable - CAT 5 to PS/2 & VGA		(G8333)	$187

Avocent KVM Over CAT 5 UTP

Control hundreds or even thousands of servers from 8 users using Avocent's AMX Series KVM switches. This solution allows you to access your servers from up to 300 metres away using standard CAT 5 UTP RJ45 cabling. It also features full system management with an advanced Java-based administration tool.

Supports PC USB & SUN

Avocent



AMX5000	32 Port 8 User Matrix KVM Switch using CAT 5	Rent* $90.62/wk	(G4502)	$11,179
AMX5100	User Station for AMX5000 - Supports PS/2 & SUN	Rent* $20.83/wk	(G4503)	$1,859
AMIQ-PS2	AMX Smart Cable - CAT 5 to PS/2 & VGA		(G4501)	$330

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery

Delivery charges extra

Computer to SOHO & Infinity Cables for PS/2 & VGA



SL-CKP-02
2MTR (F0961)
$27

SL-CKP-03
3MTR (D0973)
$39

SL-CKP-05
5MTR (F0962)
$65

SL-CKP-10
10MTR (78218)
$117

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The figures quoted are based on a per week basis over 3 years. T.A.P. Terms & Conditions apply.

Avocent

For Avocent's KVM over IP and KVM over CAT 5 switches you will require one CAT 5 Smart Cable per attached server

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Belkin - KVM Switches

CONNECT MULTIPLE COMPUTERS USING BELKIN KVM SWITCHES

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery

Delivery charges extra

F1DB102P - Economy 2-Port KVM Switch



- PS/2 Platform
- Hot key switching and manual push-button port selection
- Supports resolutions up to 2048x1536@85Hz

(D3162) **$92**

F1DB104P - Economy 4-Port KVM Switch



- PS/2 Platform
- 10 second auto-scan function
- LED indicators

(D3159) **$183**

B1DAU047 - SOHO Series 2-Port KVM Switch with Audio



- USB Platform
- Audio & microphone switching support
- Supports resolutions up to 2048x1536@85Hz

Awarded Gold Award from IDEA & IDSA

(H0630) **$359**

F1DS104T - SOHO Series 4-Port KVM Switch



- PS/2 and USB Platforms
- Audio and microphone switching support
- Hot key switching and direct-port access button

(D3167) **$340**

F1DA108Tz - Admin 8-Port KVM Switch with OSD



- Daisychainable
- Hot key switching
- PS/2 keyboard and mouse emulation
- PS/2 in, PS/2 & USB out

Rent* $9.29/wk (E5377) **$829**

F1DA116Tz - Admin 16-Port KVM Switch with OSD



- Dedicated daisychain ports
- BANK address displayed on front
- PS/2 in, PS/2 & USB out
- Comes with Belkin 5 year warranty

Rent* $12.31/wk (E5378) **$1,099**

Don't forget to include your Belkin All-In-One cables



The easiest & neatest way to connect all your computers and servers to your PS/2 & USB KVM switches, providing image clarity for high-resolution applications.

PROTECT AND INSURE YOUR VALUABLE EQUIPMENT FOR LIFE

The leader in power protection! Belkin offers a complete Power Protection range, for the average home to a total office solution. All Belkin Surge Protectors are guaranteed to protect against spikes, surges and lightning strikes. We will repair or replace any damaged connected equipment, offering the best no hassles connected equipment warranty in the business. Protect your valuable computer, stereo and electrical equipment today - for a lifetime!



F5C208z2-TEL3 - SurgeMaster 8-way (2m cord) with Telephone Protection and $80,000 Warranty • Lifetime, $80,000 Connected Equipment Warranty • Internet ready telephone/fax/modem protection • Max Spike Amperage of 39,000 Amps • BlockSpace™ to allow for large transformers • EMI/Radio frequency interference filtering for clean power.

(C4607) **$125**



F5C206z2-TEL3 - SurgeMaster 6-way (2m cord) with Telephone and Coaxial Protection and $50,000 Warranty • Lifetime, $50,000 Connected Equipment Warranty • Protect your valuable Audio Visual Equipment • 1184 joule energy rating for maximum protection • 1.8 metre telephone cord and 1.8 metre coaxial cable included

(C4604) **$105**



F5C195zTEL - Single Outlet MasterCube with Telephone Protection and $15,000 Warranty • Lifetime, $15,000 Connected Equipment Warranty • Max Spike Amperage of 27,000 Amps • 824 joule energy rating for maximum protection • Internet ready telephone/fax/modem protection • Convenient and portable for travelling

(D5956) **$35**

Belkin PDA

Leather Cases



F8P6401
For Palm Zire.
(H0798)
$48



F8Y1405
For Sony Clie SL/SJ Series.
(H5024)
$48

Charger



F8Q2000
USB Sync Charger for iPAQ. Suits 3800/ 3900/5000 Series.
(E4744)
$39

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Belkin Networking Solutions

Belkin are committed to providing quality products at competitive prices. We offer lifetime warranties on almost all of our products and free expert technical support. For more detailed product information and a look at our extensive range of connectivity solutions, come and visit our new look website at www.belkin.com.au!

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54g WIRELESS NETWORK!

F5D7230au4 - **54g Wireless DSL/Cable Gateway Router**



- Compatible with all 802.11b devices
- Network security with 128-bit WEP encryption
- Works with MAC or PC computers

(J2207) **$299**

F5D7130au - **54g Wireless AccessPoint**



- Extends your 802.11b or 54g wireless network
- 3 times the operating range of 802.11a
- Adds wirelessly networked PCs to your wired network

(H2200) **$279**

All come with Belkin Lifetime Warranty

F5D7000au - **54g Wireless Desktop Network Card**



- Fits any standard 32-bit PCI expansion
- Interoperable with all 802.11b 2.4GHz devices • 3 times the operating range of 802.11a

(H2197) **$149**

F5D7010au - **54g Wireless Notebook Network Card**



- Fits any standard 32-bit Cardbus slot
- Low power consumption chipset
- Use Turbo mode for speeds of up to 54mbps

(H2196) **$149**

QUICK & SMART - USB SOLUTIONS FROM BELKIN



F8U0304
Quadra 4-in-1 Pen
• Stylus, Pen, Torch, Laser-pointer all-in-one
• PDA Stylus and ballpoint pen • Comes with batteries

(J5142) **$39**



F5U248
USB 2.0 8-in-1 Media Reader/Writer
• Works with CFI&II, SM, SD, MMC, MD, MS and MGS

(J2210) **$99**



F5U230
USB to Infrared Smartbeam
• Transfer files easily from your PDA, mobile or notebook

(H0927) **$97**



F5U900au
USB 2.0 Computer Upgrade Kit
• Achieve speeds of up to 480mbps

(F0897) **$99**

"ON THE GO"? CHECK OUT SOME OF OUR MOBILE ACCESSORIES

F8E825-USB - **Mini-Wireless Optical Mouse (USB)**



- The popular optical mini-mouse is wireless!
- Small and compact for travellers
- Engineered with the latest optical technology
- 27MHz for worldwide compatibility

(H5027) **$79**

F8E466-MOB - **Numeric Keypad**



- Works instantly with USB plug&play technology
- Slim, lightweight design
- Suits any notebook that is USB ready
- Comes with Belkin Lifetime Warranty

(J2212) **$29**

F8E448 - **Retractable USB Light**



- White LED lamp provides illumination in any setting
- Notebook clip positions light where you need it
- Swivel directional head
- Retractable 19" cable

(J0895) **$29**

F5U217auMOB - **3-Port Hi-Speed USB 2.0 Pocket Hub**



- 3 USB 2.0 or USB 1.1 ports
- Extremely lightweight, perfect for travel
- Switching power supply-for worldwide use

(J2213) **$99**

HOT, HOT, HOT - Exclusive Specials from Belkin & Harris Technology!

BUNDLE! **F8E921 - SPECIAL!**

4-Port USB Hub + Optical Mini-scroller Mouse and Hi-speed Modem Cable.

(J1899) **$79**

BUNDLE! **F8E922 - SPECIAL!**

3-Port USB Pocket Hub + Wireless Optical Mini-Mouse and Retractable USB Light

(J1271) **$149**

BUNDLE! **Buy 1 get 1 FREE!** (w/cout Tel)

B5Cau015 - SPECIAL!

SurgeMaster 5-way (2m cord) with Telephone Protection and $25,000 Warranty.

(J2214) **$79**

Belkin PDA

Hard Flip Case



F8Q1410
For HP iPAQ 3700/3900 with easy-access stylus holder

(H2222) **$59**

Penlight Stylus



For HP iPAQ 3800/3900/5000 series (G7751) **$23**

For Palm, Handspring, Sony, Jornada (G7752) **$23**

Accessories Kit
F8E924
For HP iPAQ 1910 series

(J4674) **$99**

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Verbatim

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CD and DVD Media: Storage for Life

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Delivery charges extra



DataLife Colours CD-R 80 min Colours Slim Case 10 pk 48x
(G2015)
$11



DataLife Colours CD-R 80 min Colours Slim Case 25 pk 48x
(G2890)
$25



DataLife CD-R 80 min Slim Case 10 pk 48x
(G4639)
$9



DataLife CD-R 80 min 25 pk Spindle 48x
(G6034)
$18

DataLifePlus CD-R



- 80 min 1x - 48x 10 pack
(G1680) **$10**
- 80 min 1x - 52x 10 pack slim case
(H9519) **$11**

Digital Vinyl CD-R



Designed to look like a vinyl record these eye-catching discs are a great way to save delicate LP collections or make a standout business presentation.

- CD-R: 80 min vinyl 10 pack
(G1731) **$11**

DataLifePlus Spindles

- Inkjet printable 80 min 48x spindle of 50
(G1742) **$35**
- Silver thermal printable 80 min 48x spindle of 50
(H1073) **$36**
- 80 min DatalifePlus spindle 30 pack 48x
(G5999) **$22**
- 80 min DatalifePlus spindle 50 pack 52x
(H9517) **$36**



DataLifePlus CD-RW

- 700MB CD rewritable 2x - 4x 5 pack colours
(D9230) **$7**
- 650MB 2x - 4x singles
(77492) **$2**



- 650MB 16x -24x ultra speed singles
(G1741) **$2**
- 650MB 4x -12x high speed 5 pack
(G6434) **$8**

DataLifePlus DVD-R



4.7GB DVD-R 4x singles jewel case
(H1479) **$7**

DVD-R 2x inkjet printable 20 pack spindle
(F7683) **$125**

Video case also available

DataLifePlus DVD-RW



- 4.7GB DVD-RW 1x singles jewel case
(C8841) **$9**

DataLifePlus DVD+R



- 4.7GB DVD+R 4x singles jewel case
(H1255) **$7**
- 4.7GB DVD+R 2.4x inkjet printable 20 pack spindle
(H0608) **$125**

Video case also available

DataLifePlus DVD+RW



- 4.7GB DVD+RW 2.4x singles jewel case
(D9166) **$9**

Video case also available

Verbatim DataLifePlus CD's represent the latest in technology. Featuring a proprietary blue Super-Azo dye which has the best resistance to sunlight, silver reflective layer for optimum read and write performance and multispeed recording.

AUG 28

HARRIS TECHNOLOGY™

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FINANCE METHODS ARE SUBJECT TO APPROVAL.

Pioneer

HT Web Direct
www.ht.com.au/cat/pioneer

Multimedia: DVD-ROM & DVD Writer

The world's most popular DVD writer is now even better

Pioneer's new sixth generation DVR-A06 drive now includes high speed writing to both DVD-R/RW and DVD+R/RW formats as well as improvements to writing accuracy and playback compatibility of recorded media. The latest versions of award-winning Ulead software including DVD Workshop SE with Dolby AC-3 audio encoder are also included.

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery

Delivery charges extra

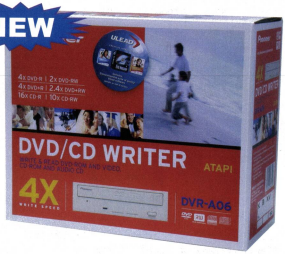
FEATURES:

Writes:

DVD-R	(4x)
DVD-RW	(2x)
DVD+R	(4x)
DVD+RW	(2.4x)
CD-R	(16x)
CD-RW	(10x)

Reads:
DVD-ROM & DVD-Video,
DVD-R, DVD+R, DVD-RW, DVD+RW
CD-ROM, CD-Extra, Video CD,
Photo-CD, CD-Text, CD-R, CD-RW.

NEW



IT & T AWARDS
RESELLER
OF THE YEAR
2002

INCLUDES COMPREHENSIVE SOFTWARE BUNDLE

nero 5 BURNING ROM

ULEAD AC-3 CREATIVE INTELLIGENCE

Ulead DVD Workshop SE with Dolby AC3 stereo audio encoder
Ulead Video Studio 7.0 SE Interactive Tutorial
Ulead Studio Suite: Video Studio 7.0 SE, DVD Movie Factory SE 2.0 & Ulead DVD Picture Show SE 2.0
Nero Express: Total CD/DVD writing solution
Software Decoder: For watching DVD Movies
High Speed Blank DVD media (1 x DVD-R, 1 x DVD-RW)

(J7075) **$549** HOT PRICE

Collect Fly Buys points on your computer hardware & software when you purchase from HARRIS TECHNOLOGY.



ReelDVD

Make professional DVDs

PRO KIT

includes ReelDVD LE professional authoring software & TMPGEnc MPEG1/2 encoder

Rent* $10.07/wk

(J7093) **$899** HOT PRICE

RENTSMART

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AUG 29

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Sales: 1300 13 9999 Web: www.ht.com.au
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LACIE

HT Web Direct
www.ht.com.au/cat/lacie

Best Storage Solutions

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery

Delivery charges extra

d2 External Hard Disks

The LaCie d2 range is a professional flexible system. Made of extruded aluminium and Zamac alloy, which are the same materials used in Formula 1 car designs for their unique features: robustness, lightweight and fast cooling. BD packages include a Kensington cable lock and power lock for excellent security. The drive switches on and off with your computer and features a front power button and blue activity LED. Supplied with drivers for PC. Drives can be used stacked horizontally or can be mounted in a 1U 19" rack (kit sold separately).



Stackable



Rack mountable

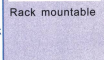
80GB	7200rpm	USB 2.0			(G1817)	$399
120GB	7200rpm	USB 2.0			(G1281)	$469
200GB	7200rpm	USB 2.0		Rent* $7.27/wk	(G4245)	$649
80GB	7200rpm	FireWire			(G1744)	$399
120GB	7200rpm	FireWire			(F7923)	$469
200GB	7200rpm	FireWire		Rent* $7.27/wk	(G3138)	$649
320GB	BD 7200rpm	FireWire	NEW	Rent* $9.29/wk	(J8536)	$829
400GB	BD 7200rpm	USB 2.0 & FireWire & F800*		Rent* $15.68/wk	(J0709)	$1,399
500GB	BD 7200rpm	USB 2.0 & FireWire & F800*		Rent* $20.16/wk	(J0710)	$1,799

*F800 is a new FireWire interface doubling transfer rate (up to 100MB/s) of current FireWire interface. Requires specific F800 card to take advantage of the performance.





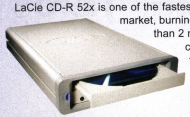
LaCie Data Bank 20GB
USB & FireWire & design by F.A. Porsche
Rent* $7.68/wk
(H2008)
$686



LaCie PCI card USB 2.0 4 ports
(G4157)
$49
FireWire PCI Card 4 ports
(G8509)
$34

d2 External CD-R 52x

LaCie CD-R 52x is one of the fastest CD-Recorder on the market, burning a full 700MB CD in less than 2 minutes. It comes complete in the now famous d2 casing, with all software for PC, cables and one CD-R media. Quiet and efficient.



CD-RW 52/24/52 USB 2.0 (H0517) **$285**
CD-RW 52/24/52 Firewire (H0519) **$315**
CD-RW 52/24/52 USB 2.0 & Firewire (H0368) **$340**
CD Duplicator 1-2-1 standalone & connected mode:
CD Duplicator CDR52+DVD16x USB2.0
Rent* $8.60/wk (J0485) **$768**

Pocket Hard Disks

LaCie Pocket hard disks are the most robust and mobile drives on the market. Made of light aluminium for better cooling and fully moulded in a silicon bumper for protection. Includes USB 2.0 and bus powered Firewire interface, complementary power supply and drivers.



20GB USB 2 .0 & FireWire
(F5369) **$369**
40GB USB 2.0 & FireWire
(F5371) **$474**
80GB USB 2.0 & FireWire
NEW Rent* $7.83/wk
(J8475) **$699**



LaCie USB Floppy Drive
(F8125)
$79

d2 External DVD-R Pioneer's

DVD-R/DVD+R/DVD-RW/DVD+RW/CD-R/CD-RW. No more battle of DVD standards, this one does it all.

NEW



DVD-R/RW/CD-RW (A06) USB 2.0 & FireWire
Rent* $7.83/wk (J6984) **$699**
DVD-R/RW/CD-RW (A06) Internal IDE drive
(J6983) **$499**

d2 Ethernet disks



Connect up to 500 users (Mac, PC & Unix) on any type of network. Windows XP embedded. USB 2.0 & Firewire expansion ports to increase capacity easily. Auto-sensing 10baseT & 100baseTX.

7200rpm Ethernet disk
(80GB) Rent* $15.68/wk (J4511) **$1,399**
(160GB) Rent* $17.92/wk (J4512) **$1,599**
7200rpm 8MB Cache Ethernet disk
(250GB) Rent* $23.52/wk (J0705) **$2,099**
(500GB) Rent* $29.26/wk (J0706) **$2,949**

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IOMEGA

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Smart Storage Solutions

Zip 750MB Drive



More speed and more capacity, this NEW 750MB drive and disk is the fastest and most durable, portable storage solution to back up your important data.
Iomega Automatic Backup software makes backup a snap and Iomega Sync software helps transfer files between computers. Zip 750MB drives and disks are the smart data storage choice.

USB 2.0 (F9601) **$370**

Firewire (G2978) **$397**

External Hard Disk Drive



Iomega External Hard Drive adds secure storage easily and quickly.
It comes complete with Iomega Sync™ and Automatic BackUp™ disaster recovery software to protect your files.

USB 2.0 80GB (F9625) **$415**

USB 2.0 120GB (J2793) **$526**

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery

Delivery charges extra

Iomega Mini Drive

Iomega USB mini-Drives weigh only 20g can be carried with your keys or in your pocket. Comes with 3 year warranty, 32 bit processor for greater speed and versatility, Iomega's unique security and software.

Host Powered 250MB USB



NEW – Host-powered Zip® 250MB USB drive.
Now it's even easier to take your information with you. The Zip® 250 USB drive is now available with a USB cable that provides both data and power, so you don't need any external power source. It's easy to connect (just plug it in) and easy to launch (no rebooting)! This new drive is compatible with most major operating systems and all Zip® 100MB and 250MB Zip® disks.

(J7553) **$248**

Portable Hard Disk Drive



Iomega portable hard drive is a complete solution that makes security, recovery and data storage easy.
QuikSync™ automatic back-up and disaster recovery software protects your files. Built in a durable, slim design that's easy to take with you.

(USB 2 Card sold separately)

USB 2.0 20GB (G4671) **$349**

USB 2.0 40GB (F9794) **$549**

NAS Servers



Non Hot Swapable Drive

A205m 160GB P4 Celeron CPU, 128MB RAM, USB 2.0 Rent* $23.42/wk (J4653) **$2,090**

A305m 240GB P4 Celeron CPU, 256MB RAM, USB 2.0 Rent* $31.89/wk (J4651) **$3,214**

Hot swapable drive/fan/power supply

P435m	320GB	Intel P4 1.8Ghz CPU, 512MB RAM	Rent* $64.08/wk (J4601)	**$7,199**
P440m	480GB	Intel P4 2.0Ghz CPU, 1GB RAM	Rent* $78.06/wk (J3572)	**$8,770**
P445m	720GB	Intel P4 2.0Ghz CPU, 1GB RAM	Rent* $90.78/wk (J3481)	**$11,199**
P800m	960GB	2 Intel Xeon 2.4Ghz CPU, 1GB RAM	Rent* $172.54/wk (J3262)	**$21,446**
P850m	1.44TB	2 Intel Xeon 2.4Ghz CPU, 2GB RAM	(J4650)	**$Call**



CD-RW 52x24x52 USB 2.0



For the fastest and easiest way to save and share music, photos and more, choose an Iomega® CD-RW drive. With up to 52x24x52 write/rewrite/read speeds you can burn a 60-minute CD in less than 3 minutes. Includes plug-and-play functionality for portability, buffer under-run protection for reliability and Iomega HotBurn® Pro software with advanced functionality easy CD customization, burning MP3s and organizing digital photos. (USB 2 Card sold seperately)

(J0752) **$325**

DVD Dual Drive



Iomega introduces its multi-format DVD/CD-RW drive you can read and record in nearly any standard format. Everything you need is here for creating, editing, and sharing video, music, photos and more!

• DVD+RW	4x Record,	2.4x ReWrite,	12x Read
• DVD-RW	4x Record,	2x Rewrite,	12x Read
• CD-RW	16x Record,	10x ReWrite,	40x Read

Don't be caught short!

Rent* $6.49/wk (J4558) **$579**

128MB



(G9836) **$158**

256MB



(H9652) **$275**

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AUG 31

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SONY®

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HT Web Direct
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DSC range with continuous MPEG recording

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery

Delivery charges extra

Digital Still Cameras

MEMORY STICK

Cyber-shot

DSCP32



- 3.2 Megapixel
- Digital Smart Zoom
- 1.6" Colour LCD
- MPEG Movie VX

(H1620) **$495**

DSCP72



- 3.2 Megapixel
- 3x Optical Zoom
- Digital Smart Zoom
- 1.6" Colour LCD
- MPEG Movie VX

Rent* $7.79/wk
(H1622) **$695**

DSCP8S



- 3.2 Megapixel
- 3x Optical Zoom
- Digital Smart Zoom
- 1.5" Colour LCD
- MPEG Movie VX
- Histogram indicator

Rent* $9.51/wk
(H9498) **$849**

DSCP92



- 5.0 Megapixel
- 3x Optical Zoom
- Digital Smart Zoom
- 1.5" Colour LCD
- MPEG Movie VX
- AF illuminator

Rent* $11.15/wk
(J4493) **$995**

DSCP10S



- 5.0 Megapixel
- 3x Optical Zoom
- Digital Smart Zoom
- 1.5" Colour LCD
- MPEG Movie VX
- Histogram indicator
- Built-in Mic & Speaker

Rent* $13.39/wk
(I0020) **$1,195**

All cameras supplied with battery, charger, software, USB cable and memory stick.

DVD +/- RECORDABLE DRIVES

DRU510A
Internal
DVD +/- RW Drive
• IDE Interface



Rent* $6.71/wk
(J4555)
$599



DRX 510UL
External
DVD +/- RW
• i.LINK & USB 2.0 Interface

Rent* $8.95/wk
(J4556)
$799

HI-SPEED CERTIFIED USB

MICROVAULT

HI-SPEED CERTIFIED USB

USM32U2	(G8386)	$95
USM64U2	(G8388)	$135
USM128U2	(G8390)	$215
USM256U2	(G8394)	$375



- USB2.0 Storage Device
- Compatible with USB1.1
- Plug 'n' Play
- Software bundle includes: Password Lock, AutoZip, Auto Login, PC Lock
- Mini Micro Vault supplied with a docking station for easy access

MINI MICROVAULT



USM32S	(J4481)	$128
USM64S	(J4482)	$159
USM128S	(J4483)	$254
USM256S	(J4484)	$430

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LCD RANGE



SDMHS53

H-SERIES

Sleek, lightweight and flexible design with zero footprint. Features include - bright picture, sharp images and wide viewing angles.

SDMHS53 15" XGA Display
Rent* $8.82/wk (J4477) **$787**

SDMHS73 17" XGA Display
Rent* $13.40/wk (J4478) **$1,196**

SDMHS93 19" SXGA Display
Rent* $21.38/wk (J4480) **$1,908**

X-SERIES

Sophisticated, smart design. All models feature DVI-D inputs in additional to standard VGA inputs, allowing digital signals.

SDMX52 15" XGA Display
Rent* $9.85/wk (F9282) **$879**

SDMX72 17" SXGA Display
Rent* $14.94/wk (F9284) **$1,333**

SDMX82 18" SXGA Display
Rent* $21.56/wk (F9286) **$1,924**

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Sony Tape Storage Solution

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery

Delivery charges extra

StorStation - AIT IDE & USB / i.LINK Tape Backup Kits



Internal AIT drive with ATAPI IDE (Ultra DMA) interface. Media life of approx 30,000 record/read cycles. Kits include: 1 cleaning tape, Retrospect software tape for desktop or server, cables and mounting screws.

Internal: SDX420B
Up to 90GB

Internal: SDX520B
Up to 130GB

AIT-1 Rent* $17.58/wk (F9899) **$1,569**

AIT-2 Rent* $29.72/wk (I0026) **$2,995**



External AIT drive with USB2.0/ i.LINK Interface. Media life of approx 30,000 record/read cycles. Kits include: 3 Tapes, 1 cleaning tape, Retrospect software for desktop or server, USB & 2 i.LINK cables.

External: AITE90UL
Up to 90 GB

AIT-1 Rent* $23.03/wk (H9667) **$2,055**

StorStation - AIT Internal or External SCSI Tape Backup Kits



AIT 3 kits include 10 x AIT3 100-260GB tapes bundled free of charge

SDX400B	35-90GB AIT 1 Internal Backup kit -	Rent* $23.77/wk (C7480)	**$2,395**
SDXD400B	35-90GB AIT1 External Backup kit -	Rent* $26.59/wk (C7478)	**$2,680**
SDX500B	50-130GB AIT2 Internal Backup kit -	Rent* $34.68/wk (E1026)	**$3,495**
SDXD500B	50-130GB AIT2 External Backup kit -	Rent* $37.79/wk (E1027)	**$3,995**
SDX700BKIT	100-260GB AIT3 Internal Backup kit -	Rent* $64.33/wk (E1029)	**$7,228**
SDXD700BKIT	100-260GB AIT3 External Backup kit -	Rent* $72.44/wk (G2855)	**$8,139**

Collect 5000 Fly Buys points when you purchase any one of: C7480, C7478, E1026, E1027, E1029, G2855

StorStation - AIT Auto Loaders - So much storage, so little space



- Single AIT drive, 8 tape capacity
- Available in AIT-1, AIT-2 & AIT-3 format
- Large Capacity: up to 2TB (AIT-3 compressed)
- Small Size: designed to fit on a desktop
- Fast Backup: Up to 112GB/h (AIT-3 compressed)
- Easy Management from the front panel
- All autoloaders include SCSI terminator & cable, 8 tapes media and cleaning cartridge

LIBD81A1
Rent* $71.20/wk (I0028) **$7,999**

LIBD81A2
Rent* $83.84/wk (I0029) **$9,999**

LIBD81A3
Rent* $97.26/wk (I0030) **$11,999**

SONY AIT Media

SDX125C
25-50GB AIT-1 Tape Media with MIC (64336)
$110

SDX135C
35-90GB AIT-1 Tape Media with MIC (B2626)
$115

SDX250C
50-130GB AIT-2 Tape Media with MIC (B0637)
$130

SDX3100C
100-260GB Single AIT-3 Data Cartridge (D6119)
$149

DDS Media

DGD120P
4mm DDS-2 120M (4/8GB) DAT Tape (13262)
$12

DGD125P
4mm DDS-3 125M (12/24GB) DAT Tape (66576)
$17

DGD150P
4mm DDS-4 150M (20/40GB) DAT Tape (88711)
$29

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Fax: 1300 13 6666 Email: sales@ht.com.au

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Maxtor®

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Outstanding Performance & Reliability

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Delivery charges extra

IT & T AWARDS
RESELLER OF THE YEAR
2002

Maxtor® Fireball 3



- 3.5-Inch 5400RPM
- Entry-Class hard drives
- Capacity up to 40GB
- Fast ATA/Enhanced IDE compatible
- Digital signal processor (DSP) based architecture
- Ultra ATA/133 data transfer speed
- 2MB SDRAM cache buffer

40GB Fireball 3 (G8761) **$145**

Maxtor® DiamondMax® Plus 8



- 3.5-Inch 7200RPM
- Mainstream Performance and Value Class Hard Drives
- Capacities Up To 40GB
- Fast ATA/Enhanced IDE compatible
- Ultra ATA data transfer speeds up to 133 MB/Sec
- 2MB cache buffer
- Quiet drive technology FDB (Fluid Dynamic Bearing) motors
- Shock and data protection system

40GB DiamondMax PLUS 8 (G0646) **$159**

Maxtor® Atlas™ 10K IV



Maxtor Atlas™ 10K IV disk drives provide outstanding performance for data-intensive applications, with 10,000RPM, an Ultra320 SCSI interface, and Maxtor's Shock Protection System.

36.7GB		(J4669)	**$340**
73.4GB	Rent* $10.41/wk	(H0657)	**$929**
146.9GB	Rent* $21.28/wk	(H0658)	**$1,899**

Maxtor® Atlas™ 15K IV



Maxtor Atlas™ 15K IV disk drives provide outstanding performance for data-intensive applications, with 15,000RPM, an Ultra320 SCSI interface, and Maxtor's Shock Protection System.

18GB		(H0664)	**$459**
36GB	Rent* $7.49/wk	(H0666)	**$669**
73GB	Rent* $15.12/wk	(H0667)	**$1,349**

Ask About...

EXTENDED HARRIS WARRANTY

- ☐ Extend to a total of 3 Years Return to Base
- ☐ Extend to a total of 5 Years Return to Base
- ☐ Upgrade Return to Base of Warranty Extension to On-Site

BIG DRIVES MAXTOR - ULTRA SERIES 7200 RPM

- Ultra fast 8MB cache
- Ultra performance ATA/133 interface
- Ultra-quiet fluid dynamic bearing (FDB) motor
- The ultimate drive for gaming, audio, and video
- Easy installation, Complete Upgrade Kit

Maxtor® 80GB Big Drive	80GB	(G5903)	**$189**
Maxtor® 120GB Big Drive	120GB	(H0554)	**$279**
Maxtor® 160GB Big Drive	160GB	(H0672)	**$369**
Maxtor® 200GB Big Drive	200GB	(H0673)	**$549**



HARRIS TECHNOLOGY
Perth, WA
NOW OPEN

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Maxtor®

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New external hard drives

Your Best Ideas Need Maxtor OneTouch™



Easy - Just push the button to make a backup copy of your files.
Fast - Back up files faster than floppy, CD or removable cartridge systems.
Convenient - Make backup copies of your files, while you work, with a simple push of a button.
Flexible - Use Maxtor OneTouch™ or run automated, unattended backups with Dantz Retrospect Express.

Quick and Easy Installation

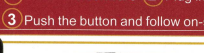
1. Install the software
2. Plug in the drive
3. Push the button and follow on-screen directions

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery

Delivery charges extra

Ask About... EXTENDED HARRIS WARRANTY

PERSONAL STORAGE 5000LE



Perfect for home or office
Exclusive Maxtor OneTouch 80GB

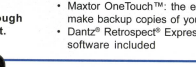
Ideal for home or office, the Maxtor Personal Storage™ 5000LE external hard drive quickly adds storage and organisational space through your computer's USB port.

80GB (G4110) **$349**

- Easy add-on storage for home or office
- Perfect for photos, music and documents
- Maxtor OneTouch™: the easy way to make backup copies of your files
- Dantz® Retrospect® Express software included
- USB 2.0/1.1 compatible
- Up to 480MB/sec data transfer rate
- Quick and easy installation
- Maxtor award-winning hard drive technology
- Stands vertically or horizontally

DON'T FORGET your Fly Buys points!

PERSONAL STORAGE 5000DV



Perfect for video editing and high-end graphics
Exclusive Maxtor OneTouch™ 160/200GB

The Maxtor 7200RPM hard drive featuring both FireWire (IEEE1394, i.LINK®) and USB 2.0 interface ports gives you one of the most versatile drives available for your PC.

160GB (H0596) **$499**

200GB Rent* $7.27/wk (H0553) **$649**

- Versatile add-on storage for editing videos and high-end graphic files
- Maxtor OneTouch™: the easy way to make backup copies of your files
- Dantz® Retrospect® Express software
- Quick and easy installation
- Flexible dual interfaces—FireWire® and USB 2.0/1.1 compatible
- Powerful performance—7200RPM

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The figures quoted are based on a per week basis over 3 years. T.A.P, Terms & Conditions apply.

PERSONAL STORAGE 5000XT



Perfect for storage-hungry files
Exclusive Maxtor OneTouch™ 250GB

Flexible add-on storage for your home or office, with room to grow. With 250GB, the Maxtor external hard drive provides you with enough capacity to hold and organize your storage-hungry applications and files.

250GB Rent* $7.83/wk (G4113) **$699**

- Flexible add-on storage for storage-hungry files
- Maxtor OneTouch™: the easy way to make backup copies of your files
- Dantz® Retrospect® Express software included
- Quick and easy installation
- Flexible dual interfaces—FireWire® and USB 2.0/1.1 compatible
- Rotational Speed 5400RPM
- Stands vertically or horizontally
- Hot-swappable

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new digital cameras.....

Canon PowerShot A300 DIGITAL CAMERA

NEW



- Compact and stylish 3.2 Megapixel digital camera with Canon 5x digital zoom
- 12 shooting modes, from complete control to full automatic mode allowing manual selection of aperture and shutter speeds.
- Movie recording and playback with sound - 640 x 480(L) and 320 x 240 (M)

(H9815) **$495**

PowerShot A70 DIGITAL CAMERA

NEW



- Compact and stylish 3.2 Megapixel digital camera with Canon 3x optical zoom lens.
- 12 shooting modes, from complete control to full automatic mode allowing manual selection of aperture and shutter speeds.
- Movie recording and playback with sound - 640 x 480 (L) and 320 x 240 (M)

Rent* $7.56/wk (H2206) **$675**

DIGITAL IXUS 400

NEW



- 4.0 Megapixel CCD image sensor delivers 2272x1704 pixel resolution.
- Canon 3x zoom lens (35mm equivalent: 36-108mm) f/2.8-4.9 with smooth 3.6x digital zoom.
- DIGIC Digital Imaging Processor combines camera controls and image signal processing to deliver superior digital pictures.

Rent* $11.15/wk (H2207) **$995**

Canon PowerShot S50 DIGITAL CAMERA

NEW



- 5 Megapixel 1/1.8" CCD image
- 2592 x 1944 pixels.
- High resolution Canon 3x f/2.8-4.9 aspherical zoom lens
- Selectable 9 point AiAF,
- 9 position white balance
- Manual and automatic shooting modes
- 3 light metering modes, from ISO50 to 400.

Rent* $15.41/wk (H2210) **$1,375**

PowerShot A60 2.0MP

NEW



Rent* $6.66/wk (H2209) **$595**

Digital IXUS II 3.2MP

NEW



Rent* $10.03/wk (J2473) **$895**

PowerShot G3 4.0MP



Rent* $15.41/wk (G4632) **$1,375**

LiDE20 flatbed scanner

LiDE Indirect Exposure



- One touch scan, copy and email.
- USB interface.
- 600 x 1200 dpi.

(F9858) **$139**

CanoScan 3000 F

NEW



- Film scanning
- 1200 x 2400 dpi optical resolution with 48-bit input depth.
- Advanced Z-Lid keeps books and other bound documents flat on the scanner for evenly lit scans.
- Fast scanning thanks to the USB 2.0 Hi-Speed interface.

(H2228) **$269**

N640P ex 600dpi	LiDE30 1200dpi	LiDE50 1200dpi	CS5000F 2400dpi film scanning	CS8000F 2400dpi film scanning	CS9900F 3200dpi film scanning
					
(D4026) **$129**	(H2229) **$209**	(H2230) **$224**	(G4633) **$379**	Rent* $6.33/wk (G5524) **$565**	Rent* $8.50/wk (H2231) **$759**

AUG 36

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Laser Printer & Multifunction devices

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Laser Shot LBP-2 410

Colour Laser Printer



- 16ppm mono, 4ppm colour
- Zero warm up time
- Fastest first page to print
- No extra RAM required
- Optional network printing
- USB 2.0 high speed connectivity for fast data transfer

Rent* $19.04/wk

(J2427) **$1,699**

imageCLASS MP730



- 5-in-1 print, copy, scan, fax and memory card printing.
- Direct Memory card printing.
- Up to 22 pages per min (mono).
- Up to 14 pages per min (colour).
- 1200 x 2400 dpi scanning resolution.
- 33.6 Kbps Super G3 Colour Fax with 30-sheet automatic document feeder

Rent* $7.83/wk (J4652) **$699**

imageCLASS mpc190



- Printer
- Scanner
- Copier

(H2216) **$269**

imageCLASS MPC 200



- Print, copy, scan, memory card printing.

(G4582) **$299**

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new printers.....

s200spx bubble jet printer



- Up to 2880 x 720 dpi resolution.
- Cost-saving permanent print head technology.

(H2211) **$76**

i70 bubble jet printer



- Print up to 13ppm in mono
- 4800 x 1200 dpi resolution.
- Direct printing from compatible Canon digital cameras.
- USB & Wireless Infrared interfaces.

(H2219) **$425**

i320 bubble jet printer



- Print up to 10ppm in mono
- Up to 7ppm in colour
- Up to 2400 x 1200dpi resolution
- Borderless 6" x 4" photo prints

(G4584) **$125**

s330 bubble jet printer



- Print up to 14ppm in mono and 10ppm colour printing
- Up to 2400 x 1200dpi resolution
- Colour lasts up to 25 years using Canon's photo paper pro

(G2318) **$139**

i450 bubble jet printer



- Print up to 18ppm in mono
- 4800x1200dpi print resolution
- 2 picolitre ink drops
- Borderless photo prints up to A4 size

(J2418) **$195**

i470d bubble jet printer



- 4800x1200 dpi print resolution
- 2 picolitre ink drops
- Camera direct and memory card direct printing
- Borderless photo prints up to A4 size

(J2419) **$385**

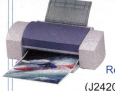
i550 bubble jet printer



- Print up to 18ppm in mono
- Up to 11ppm in colour
- Up to 4800 x 1200 dpi
- Individual ink tanks for low running costs

(H2217) **$249**

i6100 bubble jet printer



- Print up to 12ppm in mono
- 2400x1200 dpi print resolution
- 5 picolitre ink drops
- Up to A3+ size printing - 329x483mm

Rent*$6.49/wk (J2420) **$579**

i850 bubble jet printer



- Print up to 22 ppm in mono
- 14 ppm in colour
- Economical individual ink tanks
- High resolution 4800 x 1200 dpi printing

(H2218) **$339**

i9100 bubble jet printer



- A3 photo prints in around 2 minutes
- 4800x1200 dpi printing
- Borderless photo printing up to A3+ size - 329x483mm
- 6 ink system

Rent* $13.15/wk (J2421) **$1,174**

Ask About...

EXTENDED WARRANTY

- ☐ Extend to a total of 3 Years Return to Base
- ☐ Extend to a total of 5 Years Return to Base
- ☐ Upgrade Return to Base of Warranty Extension to On-Site

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The future in imaging

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Fast Delivery Australia-Wide

Ask About...

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- ☐ Extend to a total of 5 Years Return to Base
- ☐ Upgrade Return to Base of Warranty Extension to On-Site



PC USER best buy*

Magicolor 2300 DeskLaser

A colour laser printer under $2,000 without the killer inkjet running costs. Armed with high resolution, high capacity and high quality output this printer leaves nothing but a small footprint and carries a tiny cost of ownership.

HOT PRICE

Rent* $19.94/wk (F7927) **$1,779**

Print Speed	**Up to 4ppm colour A4, 16ppm mono**
Resolution	**2400 x 600dpi**
Interface	**Ethernet (10/100BaseTX); USB 1.1; Parrallel; optional Bluetooth**
Compatibility	**Windows 95/98/2000/NT/XP**

*Best Buy October 2002 by PC User Magazine



pc world RECOMMENDS

Magicolor 2300W DeskLaser

It's the desktop-size colour laser printer with a small price to match. The magicolor® 2300W is a perfect fit for small and home offices that need a dependable, user-friendly printer, but don't have a lot to spend. It sits conveniently on the desktop printing at up to 16 ppm in black and white and 4 ppm in colour.

Rent* $15.12/wk (J3802) **$1,349**

Print Speed	**Up to 4ppm colour A4, 16ppm mono**
Resolution	**1200 x 600dpi**
Interface	**USB 1.1; Parrallel**
Compatibility	**Windows 98SE/ME/2000/XP**



Magicolor 2350 DeskLaser

The magicolor® 2350 is a compact, affordable colour laser printer for both PC and Mac® users. It has speeds of up to 4 colour and 17 b&w pages per minute and includes a built-in network interface. Its most brilliant feature is its print quality. With 600 x 600 x 4bit dpi-class resolution, the magicolor 2350 produces beautiful, photorealistic output.

Rent* $23.21/wk (H2680) **$2,339**

Print Speed	**Up to 4ppm colour A4, 17ppm mono, 128MB Ram**
Resolution	**1200 x 1200dpi**
Interface	**Ethernet (10/100BaseTX); USB 1.1; Parrallel**
Compatibility	**Windows 95/98/2000/NT/XP**



PagePro1250W

The PagePro 1250W offers true 1200 x 1200 dpi printing, 16 pages per minute print speeds, 150-sheet standard input feeder, Windows compatibility, USB and Parallel interfaces and very low running costs. If you're looking for high performance personal laser printer, you won't find a better deal than the one Minolta-QMS is offering.

(J2293) **$399**

Print Speed	**Up to 16ppm A4**
Resolution	**1200 x 1200dpi**
Interface	**USB 1.1; IEEE 1284 Parallel**
Compatibility	**Windows 95/98/ME/NT4.0/2000/XP**

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Quality and innovation, no risk

SAMSUNG ML 1510

Meet the smallest one!

Key features:
- World's smallest 14ppm mono laser
- USB interface
- Windows, Macintosh and Linux compatible
- With toner save on prints at under 2.7 cents per page
- 2 year return-to-base warranty



(I0235) **$349**

SAMSUNG SCX 4216F

The Laser print solution for everyone!

Key features:
- 16ppm mono laser multifunction
- Copy, Fax, Scan and Print
- USB interface
- Windows, Macintosh and Linux compatible
- With toner save on prints at under 2.7 cents per page
- 2 year return-to-base warranty



Rent* $8.84/wk (J2137) **$789**

SAMSUNG ML 2151n

Workgroup Laser printing, with Duplexing at no extra cost!

Key features:
- 20ppm
- Network mono Laser Printer with
- Built in auto duplexing (Double Sided Printing)
- Standard 500 Sheet paper tray
- Optional Wireless printing module
- 3 year on site warranty



DigitAll*reassurance*
3 year on site warranty

Rent* $11.71/wk (J3290) **$1,045**

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Perth, WA
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Ask About...

EXTENDED HARRIS SERVICE WARRANTY

- ☐ Extend to a total of 3 Years Return to Base
- ☐ Extend to a total of 5 Years Return to Base
- ☐ Upgrade Return to Base of Warranty Extension to On-Site

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HP LaserJet Printers

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Now you can collect Fly Buys points when you purchase from HARRIS TECHNOLOGY.

Ask About... EXTENDED HARRIS WARRANTY

*FREE HP Scanjet available across all HP Color LaserJet 4600 models. Scanjet bundled with LaserJet printer

Offer ends 31st October 2003

AUG 40

HP LaserJet 1300 Series



- 20ppm with 133MHz Motorola Coldfire processor
- 1200 x 1200dpi print quality
- 16MB RAM up to 80MB max
- hp PCL 5e, 6 & Postscript level 2 emulation • 250 sheet input tray •10,000 page duty cycle.

HP LaserJet 1300
Rent* $8.95/wk (H9826) **$799**

HP LaserJet 1300N
Rent* $14.16/wk (H9827) **$1,264**

HP Color LaserJet 1500 Series



- 16ppm black, 4ppm optimal colour • Quiet operation
- 125 sheet multi-purpose
- 125 sheet face down output (250 & 500 sheet paper trays available) • straight through paper slot for thick media • ImageREt 2400 • 16MB RAM

HP Color LaserJet 1500L (Lite Version)
Rent* $17.81/wk (J2056) **$1,589**

HP Color LaserJet 1500 (Base Unit)
Rent* $23.70/wk (J2057) **$2,115**

HP LaserJet 2300 Series



- Print up to 25ppm • 1200 x 1200dpi print quality • 32MB RAM up to 288MB max • hp PCL 5e, hp PCL 6, PostScript 3™ & automatic language switching • up to 350 sheet input tray • up to 50,000 page duty cycle.

HP LaserJet 2300
Rent* $16.58/wk (H9828) **$1,480**

HP LaserJet 2300D
Rent* $17.99/wk (H9829) **$1,605**

HP LaserJet 2300N
Rent* $21.35/wk (H9830) **$1,905**

HP LaserJet 2300DN
Rent* $23.70/wk (H9831) **$2,115**

HP LaserJet 2300DTN
Rent* $26.78/wk (H9832) **$2,699**

HP LaserJet 4200 Series



- 33ppm with 300 MHz processor
- HP ProRes 1200 - true 1200dpi at engine speed
- 48MB RAM up to 416MB
- 500 sheet input tray & 100 sheet multi-purpose tray
- 2 EIO slots
- 150,000 page duty cycle.

HP LaserJet 4200
Rent* $21.39/wk (G4255) **$1,909**

HP LaserJet 4200n
Rent* $26.25/wk (G4256) **$2,645**

HP LaserJet 4200tn
Rent* $30.26/wk (G4257) **$3,049**

HP Color LaserJet 4600 Series



- 16ppm black, 16ppm color with 400 MHz processor • HP in-line technology enables printing in one pass
- 96MB RAM up to 416 MB
- 100-sheet multi-purpose tray
- 500-sheet feeder tray (additional 500-sheet paper tray available) • 3 EIO slots
- 85,000 pages duty cycle.

HP Color LaserJet 4600
Rent* $41.52/wk (E7298) **$4,389**

HP Color LaserJet 4600DN
Rent* $49.32/wk (E7299) **$5,345**

HP Color LaserJet 4600DTN
Rent* $62.97/wk (E7300) **$7,075**

HP DeskJet 9300 Series

NEW!

Fast, professional premium photo quality printing



- up to 4800 optimised dpi in color and rich black text
- Printing up to 14ppm mono & 11ppm color
- 8MB RAM built-in
- 150 sheet tray
- IEEE 1284 parallel, USB interface

HP Deskjet 9300
(J4593) **$549**

Upgrade Now and Save

Upgrading can rescue your employees from paper jams and frustrating down-time while waiting for slow printers. And most importantly, it can take the strain off overloaded IT departments. Best of all, for example, by upgrading from an HP LaserJet 4MP to an HP LaserJet 2300n, the new LaserJet 2300n will save you enough to pay for itself in just 4 months and 24 days*!

*For indicative figures on your upgrade, visit www.hp.com.au/tradeup. The independent research on this site illustrates how businesses like yours can make considerable savings. But hurry, the offer ends 31st August 2003. Call 1300 13 9999.

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HP DesignJet printers

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HP DesignJet 120 printer



• 6 separate color ink cartridges • 2400dpi resolution • Print A4 to A3+ sizes via the 100-sheet input tray • Print up to A1+ • Supports a full range of media up to 300gsm • A4 size – up to 8.5 ppm • A3 size – up to 2 minutes per page • A1 size – up to 6 minutes per page

Rent* $26.78/wk (J3677) **$2,699**

HP DesignJet 120nr printer



Contains all features of the HP Designjet 120 • Automatic roll feed for output up to 15 metres • Automatic cutter • Legs and bin • Networkable for use in workgroups with HP Jetdirect • HP Jetdirect 615n network card

Rent* $42.05/wk (J5558) **$4,445**

HP DesignJet 10/20/50ps



A3+ printers designed to deliver color-accuracy and consistency, excellent image quality and impressive print speed at amazingly affordable prices

Rent* $25.75/wk 10PS (C8931) **$2,595**

HP DesignJet 100 printer



Ultra versatile multi-format personal color printer, with output up to A1+ size.

Rent* $19.04/wk (G1248) **$1,699**

HP DesignJet 500 series



Professional large-format color printer (24 or 42in) that delivers ultimate line and photo-quality for technical markets.

Rent* $38.78/wk 24 in (A7234) **$4,099**

HP DesignJet 800 series



Network ready large-format (24 or 42in) color printer that delivers high-speed printing with uncompromising photo-quality for workgroups.

Rent* $71.20/wk 24 in (B8514) **$7,999**

HP DesignJet 815 MFP



Offers complete convenience of in-house copying, printing and scanning of large-format documents (24 or 42in).

42 in (J3048) **$59,995**

HP DesignJet 1000 series



Network ready high productivity large-format color printer (36in), that delivers premium performance, ultimate line and photo quality plus unattended printing.

Rent* $121.51/wk 1050c Plus (C8929) **$14,990**

HP DesignJet 4200 Scanner



Offers high quality scanning of large-format documents in 42in.

(J7765) **$42,999**

HP DesignJet 5500 series



Designed to meet high speed, high volume, professional quality commercial large format printing (42 or 60in).

Rent* $160.82/wk 42in (G3107) **$19,990**

Extreme Exchange Promotion*

To celebrate the launch of the HP DesignJet 120 and 120nr printers, you'll be extremely happy to know that you'll receive $350 cash rebate (for the HP DesignJet 120) or $600 cash rebate (for the HP DesignJet 120nr) when you trade in your non-HP inkjet printer^.

^ A4 size or above

* Promotion starts 1 July 2003 and ends 29th August 2003

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HP PSC & officejets

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HP PSC 1210 all-in-one



Print/Scan/Copy

• Up to 4800-optimised dpi No:1 in color • hp photoREt 3 color layering technology • Print Up to 600 x 600 dpi in black • Scan Up to 600 x 2400 dpi optical resolution (up to 19,200 dpi enhanced) • up to 36-bit colour • 8-bit greyscale (256 levels of grey) • flatbed scanner enables easy scanning and copying of photos, documents and books. • Copy speed: black up to 12 cpm, colour: up to 10 cpm

(H9162) **$179**

HP PSC 2110 all-in-one



Print/Scan/Copy

• Duty Cycle : 3,000 • Print Resolution, Black : 1200 x 1200 dpi • Color : PhotoREt 4 (optional 6-ink printing) up to 4800 optimised dpi using HP photo paper & 1200 x 1200 input dpi • Scan Resolution, Optical: 600 x 1200 dpi • Flatbed scanner, 8-bit greyscale • copy speed, black: up to 14 cpm, color up to 10cpm

(G0815) **$274**

HP PSC 2210 all-in-one



Print / Scan / Copy / Fax

• Digital camera memory card slots and easy to navigate control-panel buttons and proof sheet • Color : PhotoREt 4 (optional 6-ink printing) up to 4800 optimised dpi using HP photo paper & 1200 x 1200 input dpi • Duty Cycle : 3,000 • Print Resolution, Black : 1200 x 1200 dpi • Scan Resolution, Optical: 1200 x 2400 dpi • Copy speed, black: up to 17 cpm, color up to 12 cpm • Fax: 33.6 kbps fax modem

(G1633) **$455**

HP officejet 4110 all-in-one



Print / Scan / Fax & Copy

• High speed faxing with 33.6kbps modem • Up to 70 speed dials and 65 page memory • Professional print up to 4800-dpi color • Ideal for high resolution printing up to 600x600 dpi • Prints and copies up to 12ppm in black and 10 ppm in colour • 100 sheet capacity input tray, 25 sheet output tray • 20 pages Automatic Document Feeder • USB 2.0 connectivity • Microsoft Windows 98, 98SE, Me, 2000, XP; Macintosh OS 9, OS X

(J4673) **$299**

Ask About...

EXTENDED HARRIS WARRANTY

- ☐ Extend to a total of 3 Years Return to Base
- ☐ Extend to a total of 5 Years Return to Base
- ☐ Upgrade Return to Base of Warranty Extension to On-Site

HP officejet 5110 all-in-one



Print / Fax / Scan / Copy – hp's compact all-in-one with advanced fax features

• Up to 4800-dpi color is ideal for high resolution images and 600x600 dpi black text printing and copying • Prints up to 12ppm in black and 10ppm in color • Copies at 12cpm (black) and 8cpm (colour) • faxes 3 seconds per page • 150 sheet capacity input tray, 50 sheet output tray • 20 pages automatic document feeder • USB connectivity.

(H0634) **$359**

HP officejet 6110 all-in-one



Professional Color Communication

• Up to 19ppm in black and 15ppm in color (up to 14cpm for color copying) • Versatile flatbed and high scanning resolution using hp's unique CCD technology (1200 x 2400dpi, 48 bit color) • photoREt 4 color layering technology • 4 x 6 borderless photos • 33.6kbps built in modem, faxes 6 seconds per page • 100 sheet capacity input tray, 50 sheet output tray • USB connectivity.

(H0635) **$545**

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HP scanjets, photosmart printer & consumables

HP paper special offering

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Delivery charges extra

Take another $5 Off this price



HP q1952a
colourfast photo paper, 4R (4"x6"), 240gsm, 20 sheets
(G0321) **$16**

Take another $5 Off this price



HP c7006a
Semi gloss photo paper, A4, double-sided, 160gsm, 25 sheets
(C6840) **$13**

Take another $5 Off this price



HP c6765a
Glossy photo paper, A4, 175gsm, 20 sheets
(81524) **$17**

Take another $5 Off this price



HP q1936a
premium inkjet paper, A4, 100gsm, 200 sheets
(D9329) **$35**

HP Photosmart 7150



- 8MB built-in RAM
- 1200dpi black
- 9ppm black/ 10ppm color
- upto 4800 x 1200 optimized dpi colour printing on premium photo papers & 1200 x 1200 input dpi when printing from a computer • HP PCL 3 • 1 USB port & 1 front USB camera port • Versatile colour inkjet printer offers true-to-life photo quality results.

(F8740) **$235**

HP Photosmart 130



- 16 MB SDRAM , 2MB ROM
- color draft/normal/best
- up to 4800 x 1200 optimised dpi using HP photo paper & 1200 input dpi
- USB 2.0 Interface
- CompactFlash, SmartMedia ,Memory Stick ,Secure Digital & MultiMedia

(F8366) **$278**

HP Photosmart 7550



- 16MB built-in RAM
- 1200 dpi black
- 17pm black / 13 ppm colour
- upto 4800 x 1200 ptimised dpi colour
- HP PCL 3
- USB interface
- 100-sheet input / 50-sheet output

Rent* $7.17/wk

(G1074) **$640**

ink cartridges



No 29 Black Inkjet Cartridge (21919) **$63**

No 45 Black Inkjet Cartridge (22643) **$64**

No 78 Tri Colour Inkjet Cartridge Large (97335) **$129**

HP toner



HP c4092a LaserJet print Cartridge for hp 1100, 3200, 2500 page Toner (70459) **$128**

HP 92298a LaserJet Black Print Cartridge for 4/M, 4+/M+, 5/N/M 6800 page Toner (07995) **$195**

HP 92298x LaserJet Black Print Cartridge for 4/M+/M+ /5/5M/5N 8800 Page Toner (42504) **$208**

TAKE $5 off the marked price!

Purchase any of the following HP papers

- HP premium inkjet paper - A4, 200 sheets, 100gsm (q1936a)
- HP everyday photo paper, semi-gloss - A4, 25 sheets, double-sided, 160gsm (c7006a)
- HP photo paper, glossy - A4, 20 sheets, 175gsm (c6765a)
- HP colourfast photo paper, glossy - 4R, 20 sheets, 240gsm (q1952a)

And take a further $5 off the marked price!

See in store for details

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EPSON

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The Power to Create

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Delivery charges extra

Epson Inks

Black 810/830/925
(C9764) **$45**

Colour 810/830/925
(C9765) **$37**

Black 870/890/895/915 1270/1290
(96455) **$35**

Colour 870, 890, 895, 915
(A0630) **$32**

Black C41UX/SX
(F7743) **$20**

Colour C41UX/SX
(F7742) **$33**

Black C60/C61/CX3100
(D0043) **$52**

Colour C60/C61/CX3100
(D0044) **$47**

Epson Paper

Premium Glossy Photo Paper 100 x 150mm



(H9042) **$9**

Photo Paper (A4)



(39631) **$20**

Photo Quality inkjet paper



(77273) **$29**

EPSON STYLUS PHOTO 935



- 5760 optimised dpi using RPM technology
- 4 picolitre Micro Dots, for extremely fine print detail• EPSON Intellidge ink system
- True Border-free edge-to-edge printing on cut sheet or roll paper • Roll paper holder included • Blue tooth optional
- USB direct printing • Direct printing via camera card • CDR & Zip capabilities
- Optional LCD Preview Monitor.

Rent* $7.19/wk (J5616) **$642**

EPSON STYLUS C61



- Crisp text, vibrant colours coupled with speed and reliability • Up to 14ppm black text A4 (memo) printing • 5760 x 720 optimised dpi using RPM technology
- USB and Parallel enabled.

(F8180) **$179**

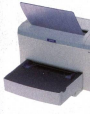
EPSON STYLUS PHOTO 2100



- Up to 2880 x 1440 dpi • 7 colour individual ink system with a new light black and either photo or matte black
- A3+ • Epson Intellidge ink system
- True Border-free printing • Roll paper printer and auto cutter • 75yrs lightfastness • Up to 1.3mm thick media support.

Rent* $20.05/wk (F2969) **$1,789**

Mono Laser Printer EPL-6100



- Fast 16ppm print engine • True 1200dpi for superior print quality!
- Powerful, 200MHz 64-bit RISC CPU!
- Class leading durability - 15,000 pages per month duty cycle• 6,000 page toner cartridges • Superb paper handling • 250 sheet paper input, Network capable.

Rent* $7.79/wk (F3399) **$695**

Multifunction Printer Home CX3100



- Printing - colour printing up to 5760 Optimised DPI up to 14ppm (black-and-white economy mode) • Standalone - full colour copier capabilities • Scanning - 48-bit colour depth (internal) scanning
- Faxing - Using your existing PC and modem take full advantage of your existing fax software.

(H0697) **$359**

PERFECTION 3200 SCANNER



- 3200 x 6400dpi optical resolution • 48-bit colour depth • Optical Density: 3.4 Dmax
- USB2.0 and IEEE1394 (Firewire) interfaces • Lid type film adapter with 4 x 5" scanning area • Scan up to two film strips of up to six 35mm frames (total of 12 frames)
- Adobe PhotoShop Elements and LaserSoft SilverFast SE6 bundled • 1 year warranty

Rent* $8.95/wk (H8527) **$799**

EPSON STYLUS PHOTO 830U



- 6-colour ink system • Up to 14ppm black text printing A4 economy • 5760 optimised dpi using RPM technology for true photo quality • MicroPiezo technology • Incredible fine 4 picolitre ink droplets • True Border-free printing • 2 x USB interface • Photo Quicker 3.4 • up to 25 years lightfastness.

(J2312) **$279**

EPSON STYLUS PHOTO 1290S



- A3+ • 6 colour photo printing • Border-free edge-to-edge printing • Max res 2880 x 720dpi with variable sized droplet technology • Over 25 years lightfastness prints • Features print image matching technology • On demand inkjet (piezoelectric) • Black text 9.4ppm (economy) • Text & photo 3.0ppm (normal)
- Full page colour 1.3ppm (normal).

Rent* $10.97/wk (G4593) **$979**

Colour Laser Printer AL-C900



The AcuLaser C900 is perfect for printing a wide range of professional office documents such as in house stationary, brochures, direct mail and flyers, customer and internal newsletters, web prints, business reports and submissions. • Printing up to 2400 dpi • 16ppm black• 4ppm colour

Rent* $17.47/wk (G8809) **$1,559**

Multifunction Printer Office CX5100



- Printing - colour printing up to 5760 Optimised DPI • up to 22ppm A4, black-and-white economy mode • Standalone - full colour copier • Scanning - 48-bit colour depth • Faxing -Using your existing PC and modem take full advantage of your existing fax software.

(H0780) **$499**

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Imation Optical & Tape Storage



Professional Grade CD-Recordable

This top-tier CD-R media provides the ultimate in optical storage. Designed for professionals and consumers who demand nothing but the best, Imation Professional Grade CD-Rs are high-durability, write-once media designed to provide high-quality data storage and superior audio recording. These premium discs feature a scratch-resistant surface and an enhanced dye layer with built-in UV degradation for maximum data reliability and longevity, Imation Professional Grade CD-Rs are capable of record speeds up to 48x.

CD-R Professional Grade Gold 5 Pack Regular Case (J6996) **$6**

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CD-Recordable

CD-R 48x 700MB/80Min 10 Pack Slim Line Jewel Case

(J6104) **$9**



DVD Media

DVD+R 4.7GB (G9267) **$7**

DVD-R 4.7GB (J6015) **$6**



CD-Recordable

CD-R 48x 700MB/80Min 25 Pack Spindle Imation Branded

(J6106) **$15**



DVD Rewritable Media

DVD+RW 4.7GB (J6024) **$12**

DVD-RW 4.7GB (G9269) **$9**



CD-RW Drives

CD-RW 40x24x40 USB 2.0 External Drive

(J6999) **$335**



DVD- Media

DVD-R 4.7GB 5 Pack

(J6016) **$30**



CD-Rewritable

CD-RW 4x 650MB/74Min 10 Pack Slim Line Jewel Case

(G2250) **$17**



CD-Rewritable Mini

CD-RW 4x Mini 80mm/8cm 185MB/ 21Min 10 Pack

(J6083) **$20**

Black Watch™ LTO/Ultrium Tape Cartridges



Imation Ultrium Lto cartridges exceed industry standards in relation to catridge construction, with features such as the patent corner snap and a three piece tape spool ensuring your data is safe with Imations Ultrium LTO cartridges. With up to 400GB capacity on the Generation 2 Ultrium Cartridge (2:1 compression) in a single compact cartridge, Imation Black Watch™ Ultrium cartridges are ideal for both stand-alone and automated environments. Imation's patented features make our Black Watch Ultrium tape cartridge the best choice for reliable and quality data storage.

Black Watch Ultrium (LTO) Tape Cartridge (100GB/200GB) with Case (J7001) **$140**

Gen2 (200GB/400GB) with Case (J7002) **$283**



Black Watch™ Black Watch DLTtape IV Compatible with DLT 4000, DLT 7000 and DLT 8000 Drives (98425) **$102**

Black watch™ Super DLTtape Compatible in both SDLT 220 and 320 Drives (G9333) **$207**



4mm Data Certified Tape Cartridges Compatible with DDS-2 Tape Drives

DDS125/ 125m (DDS-3) 12GB (E0432) **$18**

DDS150/ 150m (DDS-4) 20GB (E0439) **$32**

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Fyshwick Business Centre NOW OPEN IN ACT!

SyncMaster 171N - 17" LCD Monitor



- 17" TFT computer monitor
- 1280 x 1024 max resolution
- 16.2 million colours
- Viewing Angle: (H/V) 140° /120°
- 350:1 contrast ratio
- Ultra slim bezel (13.5mm)
- Analogue Interface
- 3 year warranty

Rent* $10.50/wk Silver (F9638) **$937**

SyncMaster 172W - 17" LCD Monitor



- 17" TFT computer monitor
- 1280 x 768 Max Resolution
- 16.2 million colours
- 400:1 Contrast Ratio
- Viewing Angle: (H/V) 140° / 110°
- Analogue / Digital Interface
- 3 year warranty

Widescreen

Rent* $14.78/wk (G9866) **$1,319**

SyncMaster 191N - 19" LCD Monitor



- 19" TFT Computer Monitor
- 1280 x 1024 max resolution
- 16.7 million colours
- 170/170 viewing angle (H/V)
- 500:1 contrast ratio
- Ultra Slim Bezel (18.6mm)
- Analogue Interface
- 3 year warranty

Rent* $16.24/wk (H1088) **$1,449**

SyncMaster 151N - 15" LCD Monitor



- 15" TFT Computer Monitor
- 1024 x 768 max resolution
- 16.7 million colours
- 140/120 viewing angle (H/V)
- 330:1 contrast ratio
- Ultra Slim Bezel (16.2mm)
- Analogue Interface
- Ultra-sleek Design
- 3 year warranty

Professional Performance Space Saving Design

Rent* $6.65/wk Silver (J2170) **$594**

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Turn on your Senses

MulitSync LCD1760V

- 17"LCD Monitor
- Resolution 1280 x 1024
- Available in black or silver/beige



Rent* $10.63wk
Black (G9679) **$949**

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LCD1560V



- 15" LCD Monitor
- Resolution 1024 x 768
- Available in black or silver/beige

Black (G8753) **$549**

Silver/Beige (G8864) **$549**

LCD 1860NX



- 18" LCD Monitor
- Resolution 1280 x 1024
- Analogue and Digital inputs

Black

Rent* $16.70/wk (H3749) **$1,490**

LCD3000



- 29.5" Viewable Image Size
- Resolution 1280 x 768
- Multi Compatibility
- Multi Screen Operations

Rent* $62.30/wk (H8526) **$6,999**

FE991SB



- 19" Flat CRT Monitor
- Resolution 1792 x 1344 @ 68HZ
- Flat aperture grille
- SuperBright function

Rent* $7.16/wk (G8754) **$639**

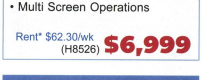
FP2141SB



- 22" Flat CRT Monitor
- Max resolution 2048 x 1536 @ 85Hz
- Flat aperture grille
- SuperBright function

Rent* $14.22/wk (G8755) **$1,269**

VT460



- Compact 2.9 kg
- 1500 ANSI lumens
- "Eco-mode" extends your lamp life

Rent* $27.24/wk (H0997) **$2,745**

NEC

V730
17" CRT Monitor
1280 x 1024
(B7522)
$239

V930
19" CRT Monitor
1600 x 1200
(C9739)
$420

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Video Editing Tools

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INSTANT COPY



- Perfect 1 for 1 CD & DVD duplication
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- Back-up your favourite PC & console game disks
- Customise your DVD videos
- Copy DVD Video or disc images from your hard drive to disc
- Burn multiple CDs or DVDs simultaneously

(H9521) **$99**

INSTANT CD / DVD



- Instant copy: CD/DVD copy
- Instant Backup: to backup & restore your files & drives
- Instant Write: lets you use your CD-R, CD-RW & DVD RAM like a floppy
- Instant Music: music arranger program
- Expression: CD/DVD authoring for still images & videos & CD label designer
- Instant Drive: virtual CD-ROM drive

(H9522) **$149**

STUDIO - First step, quick & easy video editing

The complete home movie-making package for video editing novices

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MOVIE BOX DV

- Includes full version of Studio 8 editing software
- Designed by F.A. Porsche
- Capture and output Analogue and Digital video
- Simply connects to a FireWire port on your PC or Laptop



"Also doubles as an AV/DV Convertor"

Rent* $7.56/wk (J2406) **$675**

STUDIO DELUXE

- Analogue & Digital Video editing & DVD authoring hardware/ software solution
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- Includes analogue and DV breakout box for video/ audio connections
- Includes additional 3D Hollywood FX transitions



Rent* $6.66/wk (F9330) **$595**

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- Real-time editing without a real-time card
- Stability. Edition 5 is the most stable editing software in it's class
- Scalable technology - As PC's get faster you will get more real-time features
- DVD Authoring direct from the timeline with motion backgrounds, menus and buttons
- Includes FireWire card

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EDITION 5 PRO



- Real-Time Analogue output
- Includes AGP Accelerator card for Superior Real-Time performance
- Real-time CPU and GPU based effects
- Real-Time Hollywood FX
- Plus all the features of Edition 5 DV !!

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Multimedia Tools



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Is the professional's choice for video editing, audio production, compositing, titling and advanced encoding on the PC platform. Vegas provides a complete and integrated solution for digital video production, audio recording, editing and mixing, streaming content creation, and surround sound production. Vegas 4.0 provides real-time previewing of effects and transitions from the timeline without needing to render, through any OHCI firewire card - even on a notebook!

(H1946) **$799**

Vegas® 4.0 + DVD

Includes DVD Architect, a powerful DVD Authoring tool which includes a Dolby Digital AC3® Encoder!
DVD Architect works seamlessly with Vegas 4.0, providing video professionals and DVD producers with a complete solution for DVD authoring. Vegas 4.0 markers are automatically recognised and imported into DVD Architect as chapter points.

(H1952) **$1,299**

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Sound Forge 6 (B8616) **$585**

Video Factory (D1566) **$219**

Hauppauge TV - GO (89063) **$155**

WinTV Radio (H1477) **$214**

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Hauppauge PVR 350 (H3814) **$525**

Hauppauge TV USB



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- Uses processor idle time so as to not interfere with normal disk performance
- Safe with all types of disks, including large capacity disks, RAID arrays and all databases and servers sharing disk Clusters.

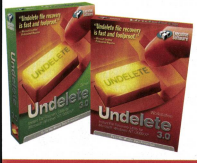
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1 Workstation (includes Media) (D5570) **$120**

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- Includes many other features!

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- **Secure FTP:** Macromedia® Contribute®2 now supports Secure FTP (SFTP) which provides completely secure, encrypted file transfers between Contribute and web servers.

WIN (J9592)
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$210



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AutoCAD® 2004

Faster Data Creation, Easier Data Sharing

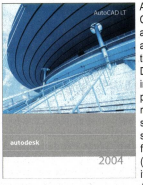


In any industry that requires technical drawings, speed and efficient use of data are critical to the success of design projects. This is where AutoCAD® 2004 software can help. It provides new productivity tools, an improved user interface, and presentation graphics for faster data creation. It offers password protection, CAD standards tools, and support for multisheet DWF™ (Design Web Format™) files for easier data sharing. It also provides new network licensing and software inventory tools for more efficient licence tracking and management.

Upgrade available: call Harris Technology on 1300 13 9999.

Price drop!! (H2412) **$6,225**

AutoCAD LT® 2004



AutoCAD LT® 2004 is the affordable 2D CAD software that helps you create and share drawings more efficiently and securely. AutoCAD LT streamlines the drafting process with an optimised DWG file format, a more intuitive interface, and new and enhanced productivity-boosting design tools. It makes sharing design data more secure with the ability to apply digital signatures to your DWG files or deliver files in the view-and-plot-only DWF™ (Design Web Format™) file format. Plus it provides full DWG compatibility with AutoCAD® 2004 and AutoCAD 2004 – based, industry-specific software.

Full Version (H2415) **$1,999**

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Autodesk® VIZ 4

Bring your designs alive with Autodesk VIZ 4, a multimedia software tool that provides a visually rich, 3D, interactive user interface Autodesk® VIZ 4 is easy to use & is interoperable with AutoCAD® applications. Upgrades also available.



(E1065) **$3,785**

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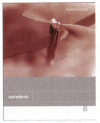
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New!

AutoSketch® 8

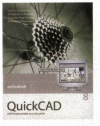
From concept sketches, information graphics and floor layouts to presentations, electrical drawings and home project plans, you can draw it - quickly and accurately - with AutoSketch® Release 8 software.



(D9136) **$229**

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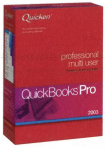
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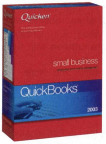
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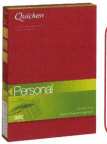
QuickBooks 2003 Small Business



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- Designed for small business
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- Easy to navigate
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- Automatically create budgets and work with them in an easy spreadsheet format
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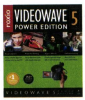
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Capture video from digital or analogue sources, arrange scenes in the StoryLine, then insert transitions, titles and audio. Enhance your clips with stunning sepia, black and white, mosaic, or selenium filters. Develop professional picture-in-picture effects by overlaying video clips. Create interactive DVD menus, buttons and chapters and preview your projects before burning with full DVD simulation. Burn your projects to CD or DVD or share streaming video over the Web. Includes two free content CDs with video clips, audio tracks, background templates and more.

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Professional Edition (G1246) **$85**

Home Edition (G1811) **$69**

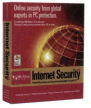
SpamKiller v 4.0



Stop those unwanted emails. McAfee SpamKiller quickly and easily stops spam from polluting your inbox. SpamKiller gives you ultimate control over your email by filtering out unwanted email while delivering the email that you want to receive. It helps stop spammers by notifying the sender's mail service of the offensive email.

WIN (I0297) **$45**

Internet Security v 5.0



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WIN (G1646) **$99**

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5 User (J8948) **$459**
10 User (J8949) **$859**
25 User (J8954) **$1,899**



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5 User (J8958) **$659**
10 User (J8961) **$1,159**
25 User (J8962) **$2,499**



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10 User (J8964) **$1,899**

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5 User (J8966) **$859**
10 User (J8967) **$1,599**

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- Norton™ Spam Alert and
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Professional Edition (F9863) **$165**

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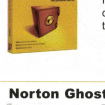
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*Source: 2002 IDC Worldwide Remote Control/ Remote Access Software Product by Vendor by Market Share report

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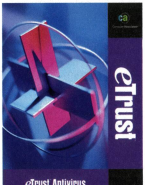
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Outlook 2002	✓	✓	✓	✓	✓
PowerPoint 2002	✓	✓	✓	✓	
Access 2002		✓	✓	✓	
Publisher 2002				✓	✓
FrontPage 2002			✓		
Developer Tools			✓		
Part Number	(C2082)	(C2084)	(C2772)		
Full Version	$920	$1,119	$1,599		
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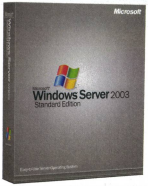
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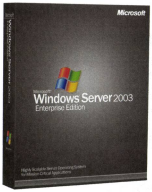
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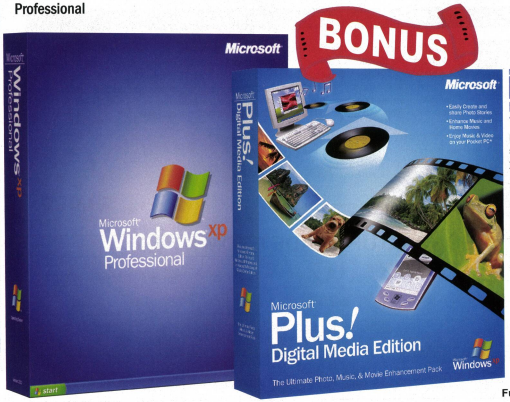
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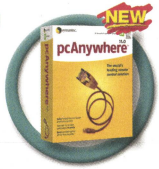
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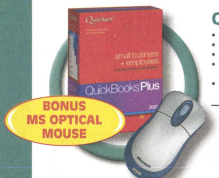
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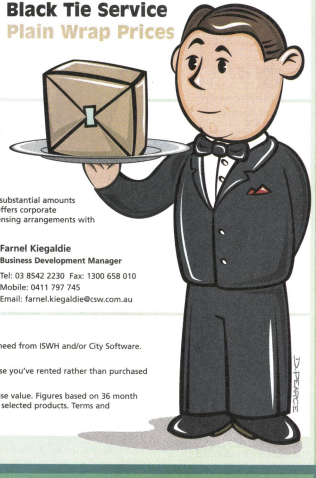
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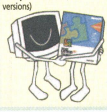
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Mitac Notebooks

Model: M-8080A-P1323WH
Series: Mitac 8080
Processor: Pentium-M 1.3GHz
Memory (RAM): 256MB
Video (RAM): Intel Extreme Graphics 2 (Up to 64MB shared)
Hard Drive: 30GB
Storage: CD-RW/DVD
Display: 14.1" TFT XGA
Modem/LAN: 56K V.90 / 10/100
Wireless/Bluetooth: Intel Pro/Wireless 2100 (802.11b)
Input/Output Ports: 1 Firewire, 3 USB2, IrDA, Card Reader (MS,SM,SD,MMC)
Operating System: Windows XP Home
Weight: 2.5 kgs
Warranty: 1 year onsite

$2585
RENTSMART $25.35 PER WEEK>
Webseach Code 207001

Model: M-8080A-P1423TWP
Series: Mitac 8080
Processor: Intel Pentium-M 1.4GHz
Memory (RAM): 256MB
Video (RAM): Intel Extreme Graphics 2 (Up to 64MB shared)
Hard Drive: 30GB
Storage: CD-RW/DVD
Display: 14.1" TFT XGA
Modem/LAN: 56K V.90 / 10/100
Wireless/Bluetooth: Intel Pro/Wireless 2100 (802.11b)
Input/Output Ports: 1 Firewire, 3 USB2, IrDA, Card Reader (MS,SM,SD,MMC)
Operating System: Windows XP Pro
Weight: 2.5 kgs
Warranty: 1 year onsite



$2677
RENTSMART $26.26 PER WEEK>
Webseach Code 207002

Mitac Computer Systems



Call 1300 300 003 and we'll help custom build your PC!

Images used for illustration purposes only. Monitor not included.

Model:
Series:
Processor:
Motherboard:
Memory (RAM):
Hard Drive (IDE):
Storage:
Graphics:
Modem/LAN:
Keyboard/Mouse:
Speakers:
Operating System:
Warranty:

T-E32-C2224S-RMWH
Midi Tower T
Intel Celeron 2.2GHz
Gigabyte GA-8SMLHP
256MB DDR
Seagate 40GB 7200rpm
CD-RW, 1.44MB Floppy
Onboard Graphics
Intergrated 10/100 NIC
MS Internet / Wheel Optical
Altec Lansing AVS200 Speaker
Windows XP Home
2 years return-to-base

$935
RENTSMART $10.25 PER WEEK>
Webseach Code 207001

Model:
Series:
Processor:
Motherboard:
Memory (RAM):
Hard Drive:
Storage:
Graphics:
Modem/LAN:
Keyboard/Mouse:
Speakers:
Operating System:
Warranty:

T-B31-C2224I-CDP
Midi Tower B
Intel Celeron 2.2GHz
Gigabyte GA-8GEM667K
256MB DDR
Seagate 40GB 7200rpm
52x CD-ROM, 1.44MB Floppy
Intel Extreme Graphics
No / Intel Pro/100 NIC
MS Internet / Wheel Optical
Altec Lansing AVS200 Speakers
Windows XP Pro
2 years return-to-base

T-E32-P2424S-RWHH
Midi Tower T
Intel Pentium 4 2.4GHz
Gigabyte GA-8SIMLHP
256MB DDR
Seagate 40GB 7200rpm
52x24x52 CD-RW, 1.44MB Floppy
Intergrated Graphics
56K / 10/100 NIC
MS Internet / Wheel Optical
Altec Lansing AVS200 Speakers
Windows XP Home
2 years return-to-base

T-B31-P2424I-CDP
Midi Tower B
Intel Pentium 4 2.4GHz
Gigabyte GA-8GEM667K
256MB DDR
Seagate 40GB 7200rpm
52x CD-ROM, 1.44MB Floppy
Intel Extreme Graphics
No / Intel Pro/100 NIC
MS Internet / Wheel Optical
Altec Lansing AVS200 Speakers
Windows XP Pro
2 years return-to-base

T-P33-P3021I-COH
Midi Tower P
Intel Pentium 4 3.0GHz 800FSB
Gigabyte GA-8IK1100 800FSB
512MB DDR400
Seagate 120GB Serial ATA 7200rpm
CD-RW/DVD, 1.44MB Floppy
Asus Ti4200-8x, 128MB
Intel Pro/100
MS Internet / Wheel Optical
Altec Lansing 221 Subwoofer Speakers
Windows XP Home
2 years return-to-base

PRICE MAY DROP! Call or visit www.iswh.com.au for best price

$995
RENTSMART $10.91 PER WEEK>
Webseach Code 197569

$1118
RENTSMART $12.26 PER WEEK>
Webseach Code 196537

$1285
RENTSMART $14.09 PER WEEK>
Webseach Code 196539

$2298
RENTSMART $22.54 PER WEEK>
Webseach Code 197570

IBM Desktop PCs

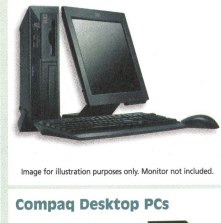


Image for illustration purposes only. Monitor not included.

Model:
Series:
Processor:
Memory (RAM):
Hard Drive (IDE):
Storage:
Graphics:
Video:
Modem/LAN:
Keyboard/Mouse:
Operating System:
Warranty:

6826222M (Black)
Desktop Small Form Factor A30
Intel Celeron 1.8GHz
128MB
40GB
48x CD-ROM, FDD
Intel Extreme Graphics
DVMT
No / 10/100
Yes
Windows XP Pro
3 years parts - 1 year labour (onsite)

8194ASM
Desktop Tower A50p
Intel Pentium 4 2.4GHz
256MB
40GB
CD-RW/DVD-ROM, FDD
64MB GeForce4
n/a
V.90 56K / 10/100
Yes
Windows XP Pro
3 years parts - 1 year labour (onsite)

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$945
RENTSMART $10.36 PER WEEK>
Webseach Code 200541

$1568
RENTSMART $17.19 PER WEEK>
Webseach Code 200554

Compaq Desktop PCs



Image for illustration purposes only. Monitor not included.

Model:
Series:
Processor:
Memory (RAM):
Hard Drive:
Storage:
Graphics:
Modem/LAN:
Operating System:
Colour:
Warranty:

DL366P#ABG
D530 Compact Mini Tower
Intel Pentium 4 2.66GHz
256MB
40GB
CD-ROM
Intel Extreme Graphics 2
No / Yes
Windows XP Pro
Carbonite/Silver
3 years

DG599P#ABG
D530 Small Form Factor
Intel Pentium 4 2.66GHz
256MB
40GB
CD-ROM
Intel Extreme Graphics 2
No / Yes
Windows XP Pro
Carbonite/Silver
3 years

PRICE MAY DROP! Call or visit www.iswh.com.au for best price

$1565
RENTSMART $17.15 PER WEEK>
Webseach Code 199333

$1518
RENTSMART $16.64 PER WEEK>
Webseach Code 199341

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IBM Notebooks



Purchase Office XP on your new laptop - Save approx. 65%*

IBM ThinkPad R Series notebooks are the best blend of portability and essential features. These affordable notebooks are for frequently mobile users who want easy, ready-to-run computing.

Model:	2684G2M
Series:	ThinkPad R40e
Processor:	Mobile Intel Celeron 1.8GHz
Memory (RAM):	128MB
Video (RAM):	16MB
Hard Drive:	20GB
Storage:	24x CD-ROM
Display:	14.1" TFT
Modem/LAN:	V.92 56K / 10/100
Wireless/Bluetooth:	n/a
Operating System:	Windows XP Home
Weight:	2.7 kgs
Warranty:	1 year pickup parts & labour

$1599 RENTSMART $17.53 PER WEEK> Websearch Code 201054

Model:	23882BM	23882FM	27229BM
Series:	ThinkPad G40	ThinkPad G40	ThinkPad R40
Processor:	Intel Pentium 4 2.4GHz	Intel Pentium 4 2.4GHz	Intel Pentium-M 1.4GHz
Memory (RAM):	128MB	256MB	256MB
Video (RAM):	DVMT	DVMT	16MB
Hard Drive:	20GB	40GB	40GB
Storage:	24x CD-ROM	8x DVD-ROM	CD-RW/DVD-ROM
Display:	14.1" TFT	14.1" TFT	14.1" TFT
Modem/LAN:	V.92 56K / 10/100	V.92 56K / 10/100	V.92 56K / 10/100
Wireless/Bluetooth:	n/a	n/a	Intel 802.11b
Operating System:	Windows XP Home	Windows XP Pro	Windows XP Pro
Weight:	3.47 kgs	3.51 kgs	2.8 kgs
Warranty:	1 year pickup parts & labour	1 year pickup parts & labour	1 year pickup parts & labour

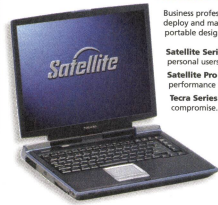
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$1975 RENTSMART $21.65 PER WEEK> Websearch Code 201050

$2125 RENTSMART $23.29 PER WEEK> Websearch Code 201051

$3095 RENTSMART $30.35 PER WEEK> Websearch Code 196990

Toshiba Laptops Systems



Business professional performance. Easy to deploy and manage. Flexible expandable and portable design.

Satellite Series - Ideal for small office and personal users.

Satellite Pro Series - Exceptional performance with wireless connectivity.

Tecra Series - Mobility and power without compromise.

Satellite model displayed.

Model:	**PS241A-680M5**
Series:	Satellite 2410
Processor:	Mobile Pentium 4-M 2GHz
Memory (RAM):	256MB
Video (RAM):	16MB
Hard Drive:	40GB
Storage:	CD-RW/DVD, Floppy Drive
Display:	15" TFT XGA
Modem/LAN:	Yes
Wireless/Bluetooth:	Wi-Fi Antenna (802.11b)
Input/Output Ports:	SD Slot, iLink, IrDA, 3 USB
Operating System:	Windows XP Pro
Weight:	3.4 kgs
Warranty:	1 year parts & labour

$2945 RENTSMART $28.88 PER WEEK> Websearch Code 196413

Model:	**PT210A-08F61**	**PT831A-009Y2**	**PP350A-002GJ**	**PPR10A-00PUH**
Series:	Satellite Pro TE2100	Tecra S1	Portege 3500 Tablet	Portege R100
Processor:	Mobile Pentium 4-M 2.2GHz	Intel Pentium M 1.4GHz	Mobile Intel P3 1.3GHz	Intel Pentium M 900MHz
Memory (RAM):	256MB	256MB	256MB	256MB
Video (RAM):	16MB	32MB	16MB	32MB
Hard Drive:	40GB	40GB	40GB	40GB
Storage:	CD-RW/DVD	CD-RW/DVD	n/a	n/a
Display:	14.1" TFT XGA	15" TFT XGA	12.1" TFT XGA	12.1" TFT XGA
Modem/LAN:	Yes	Yes	Yes	Yes
Wireless/Bluetooth:	Wi-Fi Antenna (802.11b)	WiFi Antenna	802.11b / Antenna	802.11b
Input/Output Ports:	IrDA, 2 USB	3 USB2, IrDA, SD Slot	2 USB2, SD & CF Slots, IrDA,	2 USB2, SD Slot
Operating System:	Windows XP Pro	Windows XP Pro	Windows XP Tablet OS	Windows XP Pro
Weight:	2.7 kgs	2.6 kgs	1.8 kgs	1.1 kgs
Warranty:	1 year parts & labour	1 year parts & labour	3 year parts & labour	3 year parts & labour

PRICE MAY DROP! Call or visit www.iswh.com.au for best price

$3085 RENTSMART $30.26 PER WEEK> Websearch Code 196415

$3549 RENTSMART $34.81 PER WEEK> Websearch Code 197209

$3899 RENTSMART $36.44 PER WEEK> Websearch Code 193812

$4045 RENTSMART $37.81 PER WEEK> Websearch Code 197208

$3215 RENTSMART $31.53 PER WEEK> Websearch Code 207004

AUGUST/SEPTEMBER 2003

We offer specialised advice and extremely competitive prices on IBM's range of server, workstation and notebook products. Call us for a quote today!

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Mitac Notebooks

Model: M-8080A-P1524IWP
Series: Mitac 8080
Processor: Intel Pentium-M 1.5GHz
Memory (RAM): 256MB
Video (RAM): Intel Extreme Graphics 2 (Up to 64MB shared memory)
Hard Drive: 40GB
Storage: CD-RW/DVD
Display: 14.1" TFT XGA
Modem/LAN: 56K V.90 / 10/100 based-T
Wireless/Bluetooth: Intel Pro/Wireless 2100 (802.11b)
Input/Output Ports: 1 Firewire, 3 USB2, IrDA, Card Reader (MS,SM,SD,MMC)
Operating System: Windows XP Pro
Weight: 2.5 kgs
Warranty: 1 year onsite pickup/return

$2875 RENTSMART $28.20 PER WEEK> Websearch Code 207003

Model: M-8080A-P1654IWP
Series: Mitac 8080
Processor: Intel Pentium-M 1.6GHz
Memory (RAM): 512MB
Video (RAM): Intel Extreme Graphics 2 (Up to 64MB shared memory)
Hard Drive: 40GB
Storage: CD-RW/DVD
Display: 14.1" TFT XGA
Modem/LAN: 56K V.90 / 10/100 based-T
Wireless/Bluetooth: Intel Pro/Wireless 2100 (802.11b)/ No Bluetooth built-in
Input/Output Ports: 1 Firewire, 3 USB2, IrDA, Card Reader (MS,SM,SD,MMC)
Operating System: Windows XP Pro
Weight: 2.5 kgs
Warranty: 1 year onsite pickup/return



Computer Products at Rock Bottom Prices

Maxtor 5000LE 80GB USB2 External Storage

- Easy add-on storage for home or office
- Perfect for photos, music, and documents
- Maxtor OneTouch: the easy way to make back-up copies of your files
- USB 2.0 & USB 1.1 compatible
- Up to 480Mb/sec data transfer rate
- Stands vertically or horizontally
- PC and Mac



$365
Websearch Code 194214

Maxtor 5000DV 160GB USB2/FW External Storage

- Versatile add-on storage
- Dantz Retrospect Express software included
- FireWire, i.LINK, and 1394 compatible
- USB 2.0 & USB 1.1 compatible
- 7200 RPM hard drive technology
- Up to 480Mb/sec data transfer rate – USB 2.0
- Up to 400Mb/sec data transfer rate - FireWire
- Hot swappable
- PC and Mac



$539
Websearch Code 198277

Maxtor 5000XT 250GB USB2/FW External Storage

- Dantz Retrospect Express software included
- FireWire, i.LINK, and 1394 compatible
- USB 2.0 & USB 1.1 compatible
- Up to 480Mb/sec data transfer rate – USB 2.0
- Up to 400Mb/sec data transfer rate - FireWire
- Hot-swappable
- PC and Mac



$699
Websearch Code 194228

Memory

- **Are you finding you can't multitask?**
- **Do you find data that can not be processed instantly?**
- **Do you feel like you aren't a power user but would like to be?**

If you answered yes to any of these questions, it may be time for a memory upgrade.

At ISWH, we stock a large range of memory from all the leading manufacturers. So if you are looking for an upgrade to handle your needs today, look no further than ISWH. We are able to source almost any module, so call one of our expert staff to discuss your requirements.

Need to update?

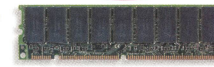


Image used for illustration purposes only

Asus and Gigabyte Graphics Cards

Image used for illustration purposes only



	Asus V9280-TD	Gigabyte R9200-128D	Gigabyte R9600PRO
Chipset	NVidia T4200	ATI Radeon 9200	ATI Radeon 9600 Pro
Memory	128MB	128MB	128MB
Memory Bus	128bit	128bit	128bit
BUS	8x/4x/2x	AGP8/4X	AGP8/4X
Memory Type	DDR	DDR 4x16-3.6	DDR 4x32-2.8
Flash BIOS	N/A	Yes	Yes
TV-out	Yes	Yes	S/RCA
DVI Port	Yes	DVI Port	DVI-I
Twin View	Yes	N/A	Yes
	$299 Webseark Code....195284	**$215** Webseark Code....207022	**$395** Webseark Code....207023

Gigabyte Motherboards

Image used for illustration purposes only



	GA-8VD667	GA-8S648FX	GA-8PE800ULTRA
Processor Support	Intel Pentium 4	Intel Pentium 4	Intel Pentium 4
FSB Support	533 MHz	800/533/400 MHz	533/400 MHz
Chipset	Intel 8652GV ICH4	SiS648FX	Intel 845PE / ICH4
Form Factor	Micro ATX	ATX	ATX
Memory / Slot / Max.	DDR266/200, 2 slots, 2GB	DDR400/333/266,3 slots, 3GB	DDR333/266, 3 slot, 2GB
AGP Connector	Intergrated graphics No AGP	8x*1	4X*1
Slot	3PCI	5PCI	6PC
Audio	AC97 6 Channel	AC97 6 Channel	AC97 6 Channel
USB Ports	6 USB2.0	6 USB2.0	10 USB2.0
LAN	Realtek 8101	Yes	Yes
	$139 Webseark Code....196379	**$159** Webseark Code....207024	**$299** Webseark Code....196078

Creative Sound Blaster Extigy

Sound Blaster Extigy is the revolutionary external quality audio solution from Creative. Designed to provide stunning digital audio to notebook or desktop users through USB, it installs quickly and a remote control is standard.

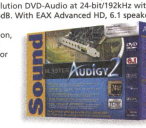
With 24-bit DACs and a 100dB signal-to-noise ratio, hardware Dolby Digital decoding, multi-channel output and 24-bit/96kHz compatible connectivity, the Sound Blaster Extigy gives a powerful high-end audio and home theatre experience. It also offers EAX ADVANCED HD music features such as Audio Clean-Up, Time Scaling and DREAM and can operate as a stand-alone Dolby Digital decoder for use with DVD players or entertainment consoles.



Standard
$299
WebsearchCode....191513

Creative Sound Blaster Audigy 2

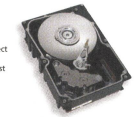
Sound Blaster Audigy 2 delivers high-quality multi-channel recording and playback at up to 24-bit/96kHz and is the first PC product to offer playback of Advanced Resolution DVD-Audio at 24-bit/192kHz with a Signal-to-Noise ratio of 106dB. With EAX Advanced HD, 6.1 speaker support, Dolby Digital EX support and THX Certification, the Sound Blaster Audigy 2 sound card is the soultion for all your music needs.



Standard	Platinum
$229	**$435**
WebsearchCode....194943	WebsearchCode....194942

Seagate Barracuda Hard Drives

- 7200 RPM desktop performance.
- 350 Gs nonoperating shock. Protect drive from shock and vibration
- 3D Defense system. Industry's most comprehensive drive and data protection system.
- DiscWizard software
- SoftSonic FDB Motor
- 2-Mbyte cache buffer.



40GB	80GB	120GB
$129	**$165**	**$209**
WebsearchCode....189720	WebsearchCode....196562	WebsearchCode....194590

Maxtor Hard Drives

The solution for performance PCs with data intensive applications such as network attached storage, home networking devices, audio, video and other multimedia applications. With Maxtor Shock Protection and Data Protection Systems on every drive, your drives and data are protected against operating and non-operating shock.



80GB
$149
WebsearchCode....194546

120GB	160GB	200GB
$199	**$279**	**$385**
WebsearchCode....195074	WebsearchCode....194751	WebsearchCode....195075

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Philips CRT Monitors

Light Frame Technology enables you to brighten and sharpen specific on-screen areas to match the vivid picture quality of TV sets. Real Flat monitors display images without the distortion from curved screens. Image Clear Enhancement (ICE) Technology is an exclusive combination of several picture tube technologies that offers dramatic picture quality improvements.

Websearch	17inch	Dot Pitch/Max Res/Refresh/Hor Scan Freq	Price
189231	107E	0.27mm/1280x1024/85/70KHz	$199
194580	107E Black	0.27mm/1280x1024/85Hz/70KHz	$199
190540	107T Flat	0.25mm/1280x1024/85/71KHz/Light Frame	$239
189494	107P Flat	0.25mm/1920x1440/115/92KHz/Light Frame	$399
	19inch	**Dot Pitch/Max Res/Refresh/Hor Scan Freq**	
192018	109S	0.27mm/1920x1440/85/92KHz/Light Frame	$389
192464	109B Flat	0.25mm/1920x1440/85/97KHz/Light Frame	$479
130602	109P Flat	0.25mm/1920x1440/85/111KHz/ICE	$765
	21inch	**Dot Pitch/Max Res/Refresh/Hor Scan Freq**	
195386	201B	0.25mm/1920x1440/85/115KHz	$999
	22inch	**Dot Pitch/Max Res/Refresh/Hor Scan Freq**	
195387	202P Flat	0.24mm/2048x1536/85/130KHz/ICE	$1345

From $199



Philips LCD Monitors

Superior brightness, high contrast ratio and excellent colour saturation for much better on-screen performance. Zero Bright-Dot monitors are guaranteed to have no bright dots (i.e. Pixels on LCD panels that are stuck permanently bright). Professional models feature DVI digital and VGA analog inputs - you get the best display performance without sacrificing compatibility with older VGA analog devices.

Websearch	15inch	Pixel Pitch/Max.Res/Refresh/Hor.Scan Freq	Price
195625	150S4FG Beige	0.297mm/1024x768/75Hz/61kHz	$499
195623	150S4FB Black	0.297mm/1024x768/75Hz/61kHz	$499
203501	150B4CG Beige	0.297mm/1024x768/75Hz/61kHzZero Bright-Dot	$645
203502	150B4CS Silver	0.297mm/1024x768/75Hz/61kHzZero Bright-Dot	$645
203500	150P4AB Black	0.297mm/1024x768/75Hz/61kHzZero Bright-DotDVI/LghtFrme5pkrs	$749
206992	150P4AG Beige	0.297mm/1024x768/75Hz/61kHzZero Bright-DotDVI/LghtFrme5pkrs	$749
	17inch		
196139	170S4FG Beige	0.264mm/1280x1024/75Hz/82kHz	$799
196140	170S4FB Black	0.264mm/1280x1024/75Hz/82kHz	$799
203504	170S4FS Silver	0.264mm/1280x1024/75Hz/82kHz	799
195624	170B4BG Beige	0.264mm/1280x1024/75Hz/82kHz/DVI	$975
196141	170B4BB Black	0.264mm/1280x1024/75Hz/82kHz/DVI	$975

From $499



18inch and 20inch LCD monitors also available.

LG Studioworks SW700S 17" CRT Monitor

Features: 0.27mm dot pitch, INVAR Mask, visual area 327 x 246mm, anti-static and anti-glare and anti-reflection surface treatment, maximum resolution 1280x1024 @60Hz, video signal: separate, OSD control, dimensions (WxDxH): 400x420x395mm,

Studioworks 900B 19" CRT Websearch:190501 $375



Websearch Code 195394 **$218**

Mitsubishi Diamond View 1770H 17" CRT Monitor

A Plug and Play colour monitor ideal for the home, office and most other computer applications. 3 year limited warranty, on-site within 50km of authorised service centres. 0.23 mm horizontal dot pitch. Flicker free high-resolution images - 1024x768 pixel resolution at up to 85Hz refresh rate. Maximum resolution of 1280x1024 pixels at 65 Hz refresh rate. Win/Mac.

Diamond View 1998E 19" CRT Websearch:206976 $399



Websearch Code 195627 **$235**

Samsung SyncMaster 753S 17" CRT Monitor

Dot pitch: 0.23mm (Hor.). Video Signal: RGB Analogue separate H/V, composite Horizontal. Frequency: 30-70KHz. Vertical Frequency: 50-160Hz. Max Resolution (based on VESA GTF Timing): 1280x1024 @ 65Hz. Recommended: 1024x768 @ 85Hz. Size (WxHxD) (mm): 398x400x412.

17" Black Websearch:195698 $235

19" CRT Beige Websearch:190344 $529



Websearch Code 195697 **$215**

Mitsubishi Diamond View DV154B 15" Black TFT LCD Monitor

Key Features: XGA (1024x768 pixel) resolution LCD panel; high brightness (250 cd/m2) and 400:1 contrast ratio; light weight - only 3.5kg ; built-in stereo amplifier and speakers; three year limited on site warranty, nationwide service centres; Win/Mac.



15" Black Websearch Code 206950 **$599**

LG L1512S 15" Silver TFT LCD Monitor

Features: 15" slim bezel TFT LCD monitor; wide viewing angle: 90°(H)/120°(V); brightness 250 cd/m2(Typical); contrast ratio 350:1 (Typical); resolution 1024x768 @ 75Hz; video signal type: Separate, RGB Analog.

LG L1511SK 15" LCD Black Websearch: 206975 $579



15" Silver Websearch Code 206974 **$535**

Sony SDMS51RB 15" Black TFT LCD Monitor

15" XGA TFT Active Matrix LCD panel (15" viewable image), lightweight (3.5kg) with zero footprint allowing flexible placement options, 400:1 contrast ratio, 250cd/m2 luminance, wide viewing angle - 140°(H) and 120°(V), Win/Mac. Includes Digital FlexRes Technology - Sony's exclusive chipset design provides a crisp clear full screen image regardless of resolution.



15" Black Websearch Code 203781 **$725**

Philips SV1 bSure LCD Projector

(1200 ANSI Lumens, SVGA)

Robust, easy-to-use LCD projector ideal for schools and medium sized businesses. Resolution: SVGA. LCD: 3x 0.7" high-temperature poly-silicon active matrix LCDs. Noise level: 27db. Lamp: 132W. 1.2x manual zoom. Projection distance: 1.1-10m. Weight: 3.7kg. Presentations and films are always of the highest quality thanks to the bSure high connectivity and special Colour Tracking feature. (LC3131)



$3295

RENTSMART $32.32 PER WEEK>

Websearch Code 195230

Philips Ugo S-Lite Impact DLP Projector

(1000 ANSI Lumens, SVGA)

Includes Digital Light Processing (DLP) technology with outstanding image quality. Compact, portable projector. DMD: 1x 0.67" DMD, 480,000 pixels, time sequential (800x600). Contrast: 650:1 (Full on/off). Lamp: 130W. Zoom: Manual zoom (x1.2) Digital zoom (x10). Projector distance: 1.2-9.4m; Diagonal (25-200)". Analog video format: NTSC, PAL, SECAM. Win/Mac.



$3849

RENTSMART $37.75 PER WEEK>

Websearch Code 195232

Philips LC6231 Garbo Home Entertainment LCD Projector

(1000 ANSI Lumens, 858x484 Resolution)

16:9 format, fully compatible with a range of products such as DVD, VHS, games consoles, computers, digital stills, cameras and tuners. Contrast Ratio (400:1). Digital Picture enhancement features. Lamp (132W 4000 hours lamp life). Super Silent (27dB Philips Air System).



$4575

RENTSMART $42.76 PER WEEK>

Websearch Code 203515

Computer Products at Rock Bottom Prices

Wacom Graphire2 4x5 USB Tablet

Primarily designed for the entry level user. Can be used for drawing/ sketching, freehand writing, illustration, painting, retouching. Comes with pressure-sensitive pen technology with 512 levels of pressure sensitivity. Comes in three colours Silver, Graphite or Sapphire Blue. Win/Mac.



Saphire Blue (Includes Pen)

$159

Websearch Code WAC340

Wacom Graphire 2 Mouse

The two button scroll mouse offers ease of use across the Graphire tablet range.



Ice Blue

$44

Websearch Code 205437

Wacom Intuos 2 USB Tablet

Introduces the era of the Grip-Pen. Pen accuracy: 0.25mm. Pressure levels: 1024. Report rate: 200pps (Points per second). Resolution 2,540 LPI (Lines per inch). In addition, Intuos2 offers a new high-resolution, ergonomically designed 2D or 4D Mouse as an optional extra. Win/Mac.



4x5 Ice Blue Includes Pen

$359

Websearch Code 189279

6x8 Ice Blue Includes Pen

$549

Websearch Code 189516

9x12 Ice Blue Includes Pen & Mouse

$749

Websearch Code 190483

12x12 Ice Blue Includes Pen

$759

Websearch Code 189268

12x18 Ice Blue Includes Pen

$1129

Websearch Code 190068

HP LaserJet 1300N

- 1200 x 1200dpi
- 20ppm Black
- 16MB Ram
- 250 sheet tray
- Parallel / USB
- Win / Mac
- Ethernet ready

HP 1300 $765
Websearch 196460
RentSmart $8.39



RENTSMART $13.14 PER WEEK> **$1199**

Websearch Code 196461

HP LaserJet 2300N

- 1200 x 1200dpi
- 25ppm black
- 48MB RAM
- 350 sheet input
- Parallel / USB
- Win / Mac
- Ethernet ready

HP 2300 $1369
Websearch
196462
RentSmart
$15.01

HP 2300D $1499
Websearch
196411
RentSmart $16.43



RENTSMART $19.72 PER WEEK> **$1799**

Websearch Code 196383

HP LaserJet 4200N

- 1200 x 1200dpi
- 35ppm black
- 48MB RAM
- 600 sheet input
- Parallel
- Win / Mac
- Ethernet ready

HP 4200 $1799
Websearch
196515
RentSmart
$19.72

HP 4200DTN $3399
Websearch
195314
RentSmart $33.34



RENTSMART $24.51 PER WEEK> **$2499**

Websearch Code 196185

HP LaserJet 4300N

- 1200 x 1200dpi
- 43ppm black
- 80MB RAM
- 600 sheet input
- Parallel
- Win / Mac
- Ethernet ready

HP 4300 $2499
Websearch
196463
RentSmart
$24.51

HP 4300DTN $3999
Websearch
195409
RentSmart $37.38



RENTSMART $30.39 PER WEEK> **$3099**

Websearch Code 196364

HP Colour LaserJet 2500N

- 600 x 600dpi
- 16ppm black, 4ppm colour
- 64MB Ram
- 100 sheet multi-purpose tray & 250 sheet input tray
- Win / Mac
- Ethernet ready

HP 2500 $1879
Websearch
192925
RentSmart $20.60



2500N
RENTSMART $28.43 PER WEEK> **$2899**

Websearch Code 195285

HP Colour LaserJet 4600

- 600 x 600dpi
- 16ppm black
- 96MB RAM
- 600 sheet input
- Parallel
- Win / Mac
- Ethernet ready

HP 4600DN $5075
Websearch
195840
RentSmart $46.26

HP 4600DTN $6699
Websearch
196464
RentSmart $58.13



RENTSMART $40.18 PER WEEK> **$4299**

Websearch Code 196365

Lexmark E323T Laser Printer

- 600 x 600dpi
- 45ppm black
- 32MB RAM
- 500 sheet input
- USB / Parallel
- Win / Mac
- Ethernet ready

Lexmark E323TN
$1249
Websearch 197578
RentSmart $13.69



RENTSMART $8.76 PER WEEK> **$799**

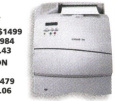
Websearch Code 197577

Lexmark T522N Laser Printer

- 1200 x 1200dpi
- 24ppm black
- 16MB RAM
- 600 sheet input
- USB / Parallel
- Win / Mac
- Ethernet ready

Lexmark T522 $1499
Websearch 194984
RentSmart $16.43

Lexmark T522DN
$2249
Websearch 196479
RentSmart $22.06



RENTSMART $18.29 PER WEEK> **$1669**

Websearch Code 196387

Lexmark W812N Laser Printer

A3 Printer

- 600 x 600dpi
- 26ppm black
- 16MB RAM
- 250 sheet input
- USB / Parallel
- Win / Mac
- Ethernet ready

Lexmark W812 $2199
Websearch
196366
RentSmart
$24.10



RENTSMART $29.41 PER WEEK> **$2999**

Websearch Code 196480

Lexmark T620N Laser Printer

- 1200 x 1200dpi
- 28ppm black
- 16MB RAM
- 600 sheet input
- USB / Parallel
- Win / Mac
- Ethernet ready

Lexmark T620 $1849
Websearch
196368
RentSmart
$20.27

Lexmark T620DN $3099
Websearch 196516
RentSmart $30.39



RENTSMART $24.51 PER WEEK> **$2499**

Websearch Code 196369

Lexmark W820N Laser Printer

- 600 x 600dpi
- 45ppm black
- 32MB RAM
- 500 sheet input
- USB / Parallel
- Win / Mac
- Ethernet ready

Lexmark W820DN
$5799
Websearch 197576
RentSmart $52.86



RENTSMART $45.57 PER WEEK> **$4999**

Websearch Code 197579

Lexmark C750N Colour Laser Printer

- 1200 x 1200dpi
- 19ppm black, 19ppm Colour
- 64MB RAM
- 600 sheet input
- USB / Parallel
- Win / Mac
- Ethernet ready

Lexmark C750 $4399
Websearch
196371
RentSmart $44.29

Lexmark C750DN $5149
Websearch
196517
RentSmart $46.94



RENTSMART $42.98 PER WEEK> **$4599**

Websearch Code 196372

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VISA MasterCard AMEX BANKCARD RENTSMART

Brother HL5040

The HL-5040 is a 16ppm personal laser printer with a high quality 2400 x 600 dpi resolution combined with a standard memory of 8MB expandable up to 136MB. Win/Mac

Brother HL5050
$679
Websearch
195666
RentSmart
$7.44



HL5040
RENTSMART $5.65 PER WEEK>
Websearch Code 195276
$515

Brother HL1870N

The HL-1870N laser printer has built-in duplexing capabilities, fast 18 ppm print speed with outstanding quality HQ1200 dpi print resolution, 32 MB memory (expandable to up to 144MB with option). Win/Mac

Brother HL1850
$1099
Websearch
207013
RentSmart
$12.05



HL1870N
RENTSMART $14.79 PER WEEK>
Websearch Code 192724
$1349

Brother HL7050N

A Network ready printing solution for the workgroup with up to 28ppm print speed, 64MB memory (Up to 288MB with option), high quality HQ1200 dpi print resolution and a comprehensive range of options available to expand the capabilities of the HL-7050N. Win/Mac

Brother HL7050
$1649
Websearch
206979
RentSmart
$18.08



HL7050N
RENTSMART $22.79 PER WEEK>
Websearch Code 206977
$2079

Brother MFC9180

The MFC-9180 5-in-1 Laser Flatbed Multi-Function Centre has a digital copier, laser printer, laser fax, colour flatbed scanner, and PC Fax. It features a digital copier that delivers up to 10 copies per minute at 600 x 600 dpi. The copier includes a 30-page Automatic Document Feeder (ADF) and a 200-sheet capacity paper tray. Also included is a 9600 x 9600 dpi (Interpolated) colour scanner. Win/Mac.

Brother MFC9160
$899
Websearch
192819
RentSmart $9.85



MFC9180
RENTSMART $10.07 PER WEEK>
Websearch Code 192772
$919

Brother FAX1020e

The FAX-1020e is a plain paper fax machine which includes a 512KB memory for broadcasting, super quick-scan and up to 25 page out-of-paper reception memory.

Brother FAX1030e
$369
Websearch
206980



FAX1020e
Websearch Code 193981
$329

Brother MFC5200c

The MFC-5200C 6-in-1 Colour Flatbed Multi-Function Centre features a colour flatbed digital copier, colour printer, colour fax, colour flatbed digital scanner, PC faxing capabilities and a PhotoCapture centre. Other features include: simple one-touch key for scanning directly to e-mail, OCR, and imaging applications, high-resolution colour scanning at up to 9600 dpi, 8MB dual access memory which stores up to 400 pages, a 100-sheet capacity paper tray and 30 page Automatic Document Feeder. Win/Mac.



RENTSMART $7.00 PER WEEK>
Websearch Code 195275
$631

APC Back-UPS ES 350/500 VA USB

An affordable battery backup to provide continued uptime and hardware protection for home or office users. Contains five Australian style outlets, phone, modem, fax and DSL data line surge protection, computer interface port for USB communications.



350 VA USB
$179
Websearch Code 189734

500 VA USB
$220
Websearch Code 192546

APC Back-UPS Pro 280/420/650si

PowerChute Plus software lets your UPS shut down your application gracefully in the event of an extended power failure. Includes additional outlet for protection of printers, audible alarms, phone/modem protection and user replaceable hot swappable batteries.



280si
$269
Websearch Code APC0001

420si
$375
Websearch Code 195418

650si
$439
Websearch Code 191757

APC Surge arrest personal w/ph protection

- Phone line protection
- 315 Joules Surge Energy Capacity.
- 5.5/11kA Peak Surge Current
- Child-safe outlets
- Protection Working Indicator - warns user if its circuitry is damaged
- Site Wiring Fault Indicator



$55
Websearch Code APC0207

No line protection
$45
Websearch Code 195420

Portable



Canon BJC85 Inkjet Printer

A3



HP Deskjet 1180c Inkjet Printer

A3



Epson Stylus Photo 2100 Inkjet Printer

Canon

Webcode	Description	Black	Colour	Resolution	USB	Parallel	Platform	Price
194786	Canon S330 Inkjet Printer	14ppm	10ppm	2400x1200dpi	Yes		Win/Mac	$135
196656	Canon i450 Inkjet Printer	18ppm	12ppm	4800x1200dpi	Yes		Win/Mac	$175
195868	Canon i550 Inkjet Printer	18ppm	11ppm	4800x1200dpi	Yes	Yes	Win/Mac	$259
195869	Canon i850 Inkjet Printer	22ppm	14ppm	4800x1200dpi	Yes	Yes	Win/Mac	$329
189755	Canon S4500 Inkjet Printer **(A3)**	9ppm	6ppm	Up to 14000Dpi	Yes	Yes	Win/Mac	$439
196659	Canon i4500 Inkjet Printer **(A3)**	17ppm	12ppm	4800 x 1200dpi	Yes	Yes	Win/Mac	$719
CAN225	Canon BJC5500 Inkjet Printer **(A3)**	7ppm	2.5ppm	720 x 360dpi		Yes	Win	$1195
CAN287	Canon BJC85 Inkjet Printer **(Portable)**	5ppm	2.1ppm	Up to 720Dpi	Yes	Yes	Win/Mac	$299

hp

Webcode	Description	Black	Colour	Resolution	USB	Parallel	Platform	Price
191418	HP Deskjet 3820 Inkjet Printer	12ppm	10ppm	4800x1200dpi	Yes	Yes	Win/Mac	$139
191521	HP Photosmart 7150 Inkjet Printer	14ppm	11ppm	4800x1200dpi	Yes		Win/Mac	$219
190708	HP Photosmart 130 Inkjet Printer		Les 3min -4" by 6"	4800x1200dpi	Yes		Win/Mac	$259
192269	HP Deskjet 6122 Inkjet Printer	20ppm	13ppm	4800x1200dpi	Yes	Yes	Win/Mac	$259
192268	HP Deskjet 1180c Inkjet Printer **(A3)**	8ppm	7ppm	Up to 1200dpi	Yes	Yes	Win/Mac	$399
192234	HP Photosmart 7550 Inkjet Printer	17ppm	13ppm	4800x1200dpi	Yes	Yes	Win/Mac	$629

Epson

Webcode	Description	Black	Colour	Resolution	USB	Parallel	Platform	Price
190484	Epson Stylus C41UX Inkjet Printer	12ppm	5.4ppm	1440x720dpi	Yes		Win/Mac	$99
191357	Epson Stylus C61 Inkjet Printer	14ppm	14ppm	5760 x 720dpi	Yes	Yes	Win/Mac	$179
197199	Epson Stylus Photo 830U Inkjet Printer	14ppm	14ppm	5760 x 720dpi	Yes		Win/Mac	$259
194375	Epson Stylus C82 Inkjet Printer	22ppm	11ppm	5760 x 1440dpi	Yes	Yes	Win/Mac	$345
193005	Epson Stylus Photo 915 Inkjet Printer	7.8ppm	3.2ppm	5760 x 720dpi	Yes		Win/Mac	$435
196881	Epson Stylus Photo 935 Inkjet Printer	8.5ppm	8.5ppm	Up to 5760	Yes		Win/Mac	$615
194129	Epson Stylus Photo 1290 Inkjet Printer **(A3)**	9.4ppm	9ppm	2880 x 720dpi	Yes	Yes	Win/Mac	$969
190431	Epson Stylus Photo 2100 Inkjet Printer **(A3)**	7.5ppm	7.3ppm	2880 x 1440dpi	Yes	Yes	Win/Mac	$1699

Computer Products at Rock Bottom Prices

AF Airdusters

Pure compressed gas for blowing dust and debris from inaccessible areas of computer and office equipment.



Sprayduster 125ML (invertable)
$12.50
Websearch Code 192739

Sprayduster 200ML (invertable)
$15.95
Websearch Code 192740

Sprayduster 400ML
$22.50
Websearch Code 192741

AF Keyboard Cleaner

Wet/dry anti-bacterial sachet wipes for cleaning keyboards, computer casings and cables. Very powerful antibactericidal cleaner. Special cleaning cards assist cleaning between keys. Sachets packed 295 x 305mm lint-free cloths. Absorbent dry wipe to provide final polish.



$12.95
Websearch Code 192742

AF Printer Kits

All your needs for keeping your printer in top condition.



Printer Rubber Restorer 100ml
$7.50
Websearch Code 192746

Inkjet Printer Cleaning Kit
$29.95
Websearch Code 192747

Printclene Laser & Fax. 25 Sheets
$22
Websearch Code 192748



Compare our Prices! We will beat any advertised price





Canon BubbleJet Cartridges

Ensure high quality images and text from the first print to the last. Canon Bubblejet cartridges are designed to give you maximum output and ensure customer satisfaction on every page.

Websearch	Product	Price
MB232	Canon Inkjet Cartridge BC02 Black	$40.00
CAN236	Canon Inkjet Cartridge BC03 Black	$38.00
CAN064	Canon Inkjet Cartridge BC05 Colour	$49.00
CAN072	Canon Inkjet Cartridge BC1-21BK Black	$12.50
CAN071	Canon Inkjet Cartridge BC1-21C Colour	$32.00
189700	Canon Inkjet Cartridge BC20 Black	$52.80
CAN086	Canon Inkjet Cartridge BC1-10BK Black	$24.90
CAN084	Canon Inkjet Cartridge BC1-11C Colour	$33.00
CAN015	Canon Inkjet Cartridge BC21E Colour	$75.00

Epson InkJet Cartridges

Features quick-drying, acid-free ink with superior resistance to bleeding and smudging on all media types.

Websearch	Product	Price
130914	Epson Inkjet Cartridge Black - C13T028091	$49.00
189243	Epson Inkjet Cartridge Colour - C13T029091	$42.90
EPS428	Epson Inkjet Cartridge Black - C13T013091	$27.00
EPS011	Epson Inkjet Cartridge Colour - C13T014091	$34.10
EPS334	Epson Inkjet Cartridge Black - C13S020187190	$36.30
EPS333	Epson Inkjet Cartridge Black - C13S020189090	$39.50
EPS335	Epson Inkjet Cartridge Colour - C13S020119190	$43.50
EPS012	Epson Inkjet Cartridge Colour - C13S020119390	$31.50
EPS069	Epson Inkjet Cartridge Black - C13S020093390	$31.50

HP DeskJet Cartridges

Each HP inkjet print cartridge consists of an integrated printhead and ink supply; designed for easy snap-out/drop-in for clean, fast replacement. The result is a new printhead and fresh ink every time the print cartridge is exchanged for maximum print quality and reliability.

Websearch	Product	Price
190196	HP Inkjet Cartridge No 45 Black - 51645AA	$58.00
129395	HP Inkjet Cartridge No 41 Colour - 51641AA	$60.00
HPI008	HP Inkjet Cartridge No 29 Black - 51629AA	$58.00
HPI007	HP Inkjet Cartridge No 49 Colour - 51649AA	$60.00
192529	HP Inkjet Cartridge No 15 Black - C6615DA	$55.00
130079	HP Inkjet Cartridge No 23 Colour - C1823DA	$64.00
190354	HP Inkjet Cartridge No 78 Colour - C6578DA	$64.00
HP1034	HP Inkjet Cartridge No 20 Black - C6614DA	$56.00



HP Mono LaserJet Cartridges

HP LaserJet print cartridges have been designed to work together with your HP LaserJet printer. You will always get clear, sharp text and graphics for high-impact results.

Websearch	Product	Price
AUC125	HP LaserJet 5L/6L Series 2,500 Page Toner - C3906A	$121.00
HWP001	HP LaserJet 1100 Series 2,500 Page Toner - C4092A	$120.00
192755	HP LaserJet 1200 Series 3,500 Page Toner - C7115X	$154.00
HWP002	HP LaserJet 2100 Series 5,000 Page Toner - C4096A	$195.00
129465	HP LaserJet 4/5 Series 6,800 Page Toner - 92298A	$184.00
192571	HP LaserJet 4000 Series 10,000 Page Toner - C4127X	$242.00
192673	HP LaserJet 4100 Series 10,000 Page Toner - C8061X	$242.00



Lexmark Mono Laser Printer Supplies

The finest quality printers only perform at their best with the right toner. Lexmark Mono Laser print cartridges are specifically designed to assure optimal print quality, with crisp dark output from first print to last. "Clean hands" design assures an easy, clean installation and removal.

Websearch	Product	Price
195001	Lexmark Toner Cartridge for Optra S 17.6K - 1382925	$425.00
195002	Lexmark Toner Cartridge Remanufactured for Optra S 17.6K - 12A0150	$308.00
195003	Lexmark Toner Cartridge for Optra T 25K - 12A5845	$535.00
195004	Lexmark Toner Cartridge Remanufactured for Optra T 25K - 12A5140	$429.00
195005	Lexmark Toner Cartridge for T52X Series 20K - 12A6835	$450.00
195006	Lexmark Toner Cartridge for T62X Series 30K - 12A6865	$590.00
195007	Lexmark Toner Cartridge E32X Series 6K - 08A0478	$275.00

We carry a full range of supplies.
Please call 1300 300 003 if your supplies are not listed above.

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Call 1300 300 003 or visit www.ianwh.com.au as prices may change due to daily fluctuations and online discounts.

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Keytek Compatible Inkjet Cartridges

With 10 years of experience, Keytek is the largest independent supplier of Inkjet Cartridges in Australia. We have an extensive range of compatible Inkjet Cartridges for Epson, Canon, Hewlett Packard, Sharp, Brother and Xerox all manufactured to the highest standard and come with a 100% replacement warranty. A sensible alternative to the expensive Original cartridges and guaranteed to give quality and performance.

SAVE UP TO 50% on your printer supplies

Websearch	193674	Keytek Compatible Ink Cartridge Canon Black for BJ 4000/4100/5500/2000 Series - BCI21BK	$9.00
Websearch	193668	Keytek Compatible Ink Cartridge Canon Black for BJ 6000/6200/6500/5450/S4500 - BCI3EBK	$15.00
Websearch	193673	Keytek Compatible Ink Cartridge Canon Colour for BJ 4000/4100/5500/2000 Series - BCI21C	$15.00
Websearch	193667	Keytek Compatible Ink Cartridge Canon Cyan for BJ 6000/6200/6500/5450/S4500 - BCI3EC	$13.00
Websearch	193666	Keytek Compatible Ink Cartridge Canon Magenta for BJ 6000/6200/6500/5450/S4500 - BCI3EM	$13.00
Websearch	193662	Keytek Compatible Ink Cartridge Canon Yellow for BJ 6000/6200/6500/5450/S4500 - BCI3EY	$13.00
Websearch	193640	Keytek Compatible Ink Cartridge Epson Black for Stylus 400/500/600/700 - S020093	$18.00
Websearch	193637	Keytek Compatible Ink Cartridge Epson Black for Stylus 440/460/640/660/670/720/1200 - S020187	$20.00
Websearch	193636	Keytek Compatible Ink Cartridge Epson Black for Stylus 480/580/C20UX/C40SX/C40UX - T013	$15.00
Websearch	193633	Keytek Compatible Ink Cartridge Epson Black for Stylus 680 - T017	$32.00
Websearch	193630	Keytek Compatible Ink Cartridge Epson Black for Stylus 800/850/1520 - S020108	$18.00
Websearch	193629	Keytek Compatible Ink Cartridge Epson Black for Stylus 880 - T019	$18.00
Websearch	193810	Keytek Compatible Ink Cartridge Epson Black for Stylus C41 - T038	$19.00
Websearch	193639	Keytek Compatible Ink Cartridge Epson Colour for Stylus 400/600/800/850/1520 - S020089	$20.00
Websearch	193635	Keytek Compatible Ink Cartridge Epson Colour for Stylus 480/580/C20UX/C40SX/C40UX - T014	$19.00
Websearch	193632	Keytek Compatible Ink Cartridge Epson Colour for Stylus 680 - T018	$27.00
Websearch	193619	Keytek Compatible Ink Cartridge Epson Colour for Stylus 810 - T027	$33.00
Websearch	193811	Keytek Compatible Ink Cartridge Epson Colour for Stylus C41 - T039	$29.00
Websearch	193623	Keytek Compatible Ink Cartridge Epson Colour for Stylus C60 - T029	$33.00
Websearch	193606	Keytek Compatible Ink Cartridge HP Black for DJ 400/500 Series - HP51626AA	$42.00
Websearch	193689	Keytek Compatible Ink Cartridge HP Black for DJ 600/660C/670/690 - 51629AA	$42.00
Websearch	193687	Keytek Compatible Ink Cartridge HP Black for DJ 610/640C/656C - C6614DA	$38.00
Websearch	193608	Keytek Compatible Ink Cartridge HP Black for DJ 840C/845C/948C - C6615DA	$38.00
Websearch	193607	Keytek Compatible Ink Cartridge HP Black for DJ 930C/990CXi/1220C - 51645AA	$45.00
Websearch	193609	Keytek Compatible Ink Cartridge HP Colour for DJ 320/340/400/540/550C/560C - 51625AA	$52.00
Websearch	193688	Keytek Compatible Ink Cartridge HP Colour for DJ 640C/656C/350/660/660C/670/690 - 51649AA	$52.00

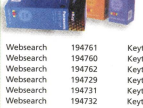


Keytek Compatible Toner Cartridges

Keytek has an extensive range of premium compatible Toners for Laser and Photocopier Printers both in black and colour, all manufactured to the highest standard and to meet or exceed O.E.M. specifications but at a very competitive price point.

SAVE UP TO 50% on your printer supplies

Websearch	195085	Keytek Laser Toner Economy for HP 1100 Series - C4092A	$105.00
Websearch	194690	Keytek Laser Toner Economy EPE for HP 4/5 Series - 92298A	$79.00
Websearch	194691	Keytek Laser Toner Economy for HP 5P/6P - C3903A	$90.00
Websearch	194725	Keytek Laser Toner Economy EPL for HP IIP/IIIP - 92275A	$72.00
Websearch	194734	Keytek Laser Toner Economy for HP 4V/4MV - C3900A	$110.00
Websearch	194735	Keytek Laser Toner Economy EPA for HP 5L/6L/3100 - C3906A	$85.00
Websearch	194736	Keytek Laser Toner Economy EP22 for HP 5Si/8000 - C3909A	$140.00
Websearch	194737	Keytek Laser Toner Economy EP32 for HP 2100/2200D - C4096A	$140.00
Websearch	194738	Keytek Laser Toner Economy for HP 4000N/4050N - C4127X	$175.00
Websearch	194739	Keytek Laser Toner Economy for HP 5000 Series - C4129X	$195.00
Websearch	194740	Keytek Laser Toner Economy for HP 8100/8150 - C4182X	$225.00
Websearch	194741	Keytek Laser Toner Economy for Lexmark Optra R 4049/LXJ/RX - 1382100	$165.00
Websearch	194758	Keytek Laser Toner Economy for Lexmark Optra S 1255/1620/2450 - 1382920	$169.00
Websearch	194759	Keytek Laser Toner Economy for Lexmark Optra T 610/614/615 - 12A5845	$225.00



Keytek Compatible Fax Cartridges

Keytek has an extensive range of Compatible Thermal Fax Films and Fax Toners for Panasonic, Sharp, Brother and Canon that are manufactured all to the highest standard to produce clear, crisp, quality prints. All products come with a 100% replacement warranty at a very competitive price point.

SAVE UP TO 50% on your printer supplies

Websearch	194761	Keytek Fax Toner Economy for Panasonic UF545/UF770 - UG3313	$145.00
Websearch	194760	Keytek Fax Toner Economy for Panasonic UF744/UF788 - UG3309	$145.00
Websearch	194762	Keytek Fax Toner Economy for Panasonic UF745/UF755 - UG3204	$145.00
Websearch	194729	Keytek Fax Toner Economy FX1 for Canon L700/L760/L3000 - H116221	$90.00
Websearch	194731	Keytek Fax Toner Economy FX2 for Canon L500/L600/L5500 - H116321	$85.00
Websearch	194732	Keytek Fax Toner Economy FX3 for Canon L200/L250/L300 - H116381	$85.00
Websearch	194733	Keytek Fax Toner Economy FX4 for Canon L800/L900/L9000 - H116401	$99.00
Websearch	195077	Keytek Compatible Fax Film Panasonic KXFA136A Refills Box 2	$36.00
Websearch	195078	Keytek Compatible Fax Film Sharp FO3CR Box 2	$25.00
Websearch	195079	Keytek Compatible Fax Film Sharp FO15CR Each	$38.00

Microsoft Train Simulator

Take the controls from the engineer's cab with 6,000 tons of freight behind you and exciting challenges ahead. Or relax in the passenger's seat and enjoy the unfolding scenery. From steam, diesels and electric engines, immerse yourself in the sights, sounds and adventures of Microsoft Train Simulator.



$45
Websearch Code 130576

Microsoft Links 2003

Links 2003 takes you to six all-new championship courses, giving you more realistic control over every shot with the new real time swing. Create your own character and play against some of the hottest pros in your own professional career, then design your home course with the Arnold Palmer Course Designer and share it online.



$62
Websearch Code 191339

Microsoft Encarta Premium Suite 2003

Access up to date, timely and accurate information from Encarta Encyclopaedia Plus, Encarta World Atlas, live Streaming Media, web links from Web Centre, literature guides, book of quotations, translation dictionaries and many additional resources.



CD
$145
Websearch Code 191336

DVD
$145
Websearch Code 191530

Computer Products at Rock Bottom Prices

Adaptec USB 2.0 PCI Connect Kit

- 4-port (1 internal) Host Bus Adaptor, Hot Pluggable Plug and Play Connectivity
- Supports up to 480 Mbps throughput. Up to 40x faster than USB1.1!
- Includes USB2.0,Latest Drivers and USB2.0 utilities available On-line.
- Win/Mac



$95

Websearch Code Win/Mac :. 189914

Adaptec DuoConnect USB 2.0/1394 PCI Combo Card Kit

- 7-port Host Bus Adaptor, 4-port USB 2.0 and 3-port FireWire (1x USB 2.0 Internal & 1x FireWire Internal).



$175

Websearch Code 189939

Adaptec USB 2.0 Upgrade Kit

- 3-port Host Bus Adaptor, Hot Puggable Plug and Play Connectivity
- For Hi-speed Digital cameras, camcorders external Storage, CD-RW's & DVD-RW's
- Includes Firewire cable and Digital Video Editing software for Windows
- Win/Mac.



$89

Websearch Code 189913



HP Premium Choice Paper

Websearch	HP Part No.	Product	Quantity	Price
192820	Q1936A	A4 98gsm Premium Paper	200 sheets	$37
195270	Q1937A	A3 91gsm Premium Paper	100 sheets	$48
196202	CHP412	A4 120gsm Premium LaserJet Paper	8 reams, 250 per ream	$165

HP Everyday Paper

Websearch	HP Part No.	Product	Quantity	Price
196203	Q2400A	A4 80gsm Everyday Paper	5 reams	$42

HP Bright White InkJet Paper

Websearch	HP Part No.	Product	Quantity	Price
196205	C1825A	A4 90gsm BrightWhite InkJet Paper	5 reams 500 per ream	$88

HP Colour Laser Paper

Websearch	HP Part No.	Product	Quantity	Price
196206	CHP350	A4 100gsm Colour Laser Paper	5 reams 500 per ream	$95



Canon Photo Paper

Websearch	Canon Part No.	Product	Quantity	Price
196192	LC301-A4II	A4 80gsm Matte Coated Paper	50 sheets	$8
192789	HR-101NA450	A4 110gsm Matte Photo Paper	50 sheets	$13
192788	GP-301NA4	A4 165gsm Glossy Photo Paper	20 sheets	$17
196194	MP-101	A4 170gsm Matte Photo Paper	50 sheets	$15
196195	PP101	A4 270gsm Glossy Photo Paper Plus	20 sheets	$20
196358	HR-101NA3II	A3 110gsm Matte Photo Paper	20 sheets	$10
196197	GP-301NA3	A3 165gsm Glossy Photo Paper	20 sheets	$35
196199	PR-101A3	A3 245gsm Pro-Quality Photo Paper	10 sheets	$34

Canon Plain Paper

Websearch	Canon Part No.	Product	Quantity	Price
196200	SW101	A4 Super-white Uncoated Plain Paper	250 sheets	$7

Canon Transparencies

Websearch	Canon Part No.	Product	Quantity	Price
196188	CF102-A4II	A4 Transparencies - All BubbleJet Printers	20 sheets	$27
196189	CF101-A4	A4 Transparencies - BJC800 Series only	50 sheets	$99



EPSON General Purpose Paper

Websearch	EPSON Part No.	Product	Quantity	Price
EPS451	S041061	Photo Quality InkJet Paper A4 210x297mm	100 sheets	$28
196187	S041068	Photo Quality InkJet Paper A3 297x420mm	100 sheets	$64

EPSON Photographic Paper

Websearch	EPSON Part No.	Product	Quantity	Price
EPS001	S041285	Premium Glossy Photo A4 210x297 (255gsm)	20 sheets	$32
EPS416	S041288	Premium Glossy Photo A3 297x420 (255gsm)	20 sheets	$80
EPS454	S041258	Matte Paper, Heavyweight A4 210x297mm	50 sheets	$27
189993	S041260	Matte Paper, Heavyweight A3 297x420mm	50 sheets	$65
190755	S041134	Photo Paper 102x152mm (4x6")	20 sheets	$17
EPS321	S041140	Photo Paper A4 210x297mm	20 sheets	$16
191281	S041142	Photo Paper A3 297x420mm	20 sheets	$50



Kodak Ultima Picture Paper (270gsm) Ultra Glossy, Satin

Websearch	Product	Quantity	Price
189300	Glossy A4 210x297mm	15 sheets	$25
195441	Satin A4 210x297mm	15 sheets	$22
195438	Glossy A4 & Satin A4 Limited stock!	15x15 shts	$25
195437	Glossy 100x150mm (4x6") & Print Pack	20 sheets	$15

Kodak Premium Picture Paper (220gsm) Ultra Glossy, Satin

Websearch	Product	Quantity	Price
189563	Glossy A4 210x297mm	15 sheets	$15
189301	Satin A4 210x297mm	15 sheets	$15

Kodak Picture Paper (190gsm) Glossy or Matte finish on both sides

Websearch	Product	Quantity	Price
195440	Glossy A4 25shts & 4x6" 20shts Ltd Stock!	25x20 sheets	$15
195433	Matte A4 210x297mm	25 sheets	$15
195434	Glossy A4 210x297mm	25 sheets	$15
195432	Glossy 100x150mm (4x6")	20 sheets	$10

CAN THE DEAL GET BETTER?
Call 1300 300 003 or visit: www.lowtb.com.au as prices may change due to daily fluctuations and online discounts.

VISA MasterCard RENTSMART

Netgear Wireless Access Point and Router WGR614

Cable/DSL Router with 802.11G access point built in works with IEEE 802.11b and IEEE 802.11g adapters
- Share broadband Internet access and resources
- Speeds of up to 54Mbps
- Four ultra fast 10/100 Mps Lan ports
- NAT Firewall protects against hackers
- Netgear 802.11b products are also available



Websearch Code 196093 **$285**

Netgear 54 Mbps Wireless PC Card WG511

Simultaneously supports 802.11g/802.11b wireless standards for secure, fastest possible network access and broadband sharing wherever you go.
- Works with both IEEE 802.11b + draft 802.11g (both 2.4 GHz)
- Speeds of up to 54 Mbps
- Office roaming for notebook PC users
- Shared broadband Internet access and resources



Websearch Code 195607 **$135**

Netgear 802.11b Wireless PCI Adaptor MA311

Lets you quickly network all of your employees for shared access to network resources, e-mail and your cable/DSL Internet connection. Experience a high, 11 Mbps data rate, and save the time and expense of Ethernet cabling. Standards-based 802.11b technology and 128-bit WEP encryption provide your network with the highest level of reliability and security.



Websearch Code 195594 **$135**

IOgear GCS-62

Use one keyboard, monitor, mouse to control two PC's. Easy to install - No software required - connecting the cables to the computers is all it takes.



$119

Websearch Code 194879

Netgear 10/100 Print Server with 2 Parallel Ports PS110

Features: autosensing 10/100 Mbps network port; simultaneous support for Windows, NetWare, and UNIX printing; support for HP, Canon, Epson, and all major parallel printers; easy installation with FirstGear, a Windows-based configuration tool; extensive LED indicators for at-a-glance status check; and flash EPROM to enable software updates.



Websearch Code 189759 **$219**

Netgear 10/100 4 Port DSL Modem Internet Gateway DG814

Enjoy high-speed Web surfing, file-sharing, Web access filtering and firewall protection.
- Integrated 4-port DSL modem for shared high-speed Web access
- Four ultra-fast 10/100 Mbps LAN ports
- NAT Firewall with VPN pass-through protection and more.



Websearch Code 195412 **$279**

Netgear 16 Port 10/100 Fast Ethernet Switch FS116

Provides your LAN with high-speed, 10/100 Mbps auto-sensing connectivity for up to 16 users. It's self-configuring, so you're ready to go. When you want greater bandwidth and increased network access for your growing business, plus quiet operation (no internal fan), FS116 is your best choice for quality, convenience and smooth-running usability - all at a very affordable price.



Websearch Code NET209 **$215**

Juzt Reboot

No matter how your System/Data is destroyed; either by virus attacks, deletion, formatting, overwrites, fdisk, modification or improper shutdowns, Just Reboot and your system will recover instantly. No other additional system/data recovery operations are required. Supports hard disks of any size and capacity.

Free 64mb Pocki USB drive. Limited time - while stocks last!

Free 64MB Pocki Drive!



$149

Websearch Code 191590

Cisco SOHO 77H ADSL Router

The SOHO Series of Routers provides affordable, secure, multi-user access for small office and home office customers while reducing deployment and operational costs for service providers and network managers. Through the power of Cisco IOS software technology, the Cisco SOHO Series Dual Ethernet, ADSL, ADSL over ISDN and G.SHDSL routers provide superior manageability and reliability.
- Affordable, multiuser access with a single DSL or Cable connection
- Internet security with firewall protection
- Easy set up and deployment with Web-based configuration tool

Proven reliability and manageability of Cisco IOS software



Soho 91 Ethernet Router
RENTSMART $6.34 PER WEEK>
Websearch Code 188851 **$578**

Soho 77H ADSL Router
RENTSMART $9.96 PER WEEK>
Websearch Code 196376 **$909**

MS IntelliMouse Explorer

Enhanced grip support, finger grooves and a new curvy shape to its signature titanium silver shell and glowing red underside. Provides up to four times the performance of other optical mice. No moving parts to collect dirt, dust and grime and no ball to be cleaned. Limited lifetime hardware warranty. Win/Mac



$79

Websearch Code 131013

Cisco PIX 501 DES Bundle

The world-leading Cisco PIX Security Appliance Series provides robust, enterprise-class, integrated network security services including stateful inspection firewalling, protocol and application inspection, virtual private networking (VPN), in-line intrusion protection, and rich multimedia and voice security-in cost-effective, easy-to-deploy solutions.

These integrated technologies create a strong multi-layered defense for todays ever changing network environments. Ranging from compact, "plug-and-play" desktop firewalls for small and home offices to modular, carrier-class gigabit firewalls for the most demanding enterprise and service-provider environments, Cisco PIX Security Appliances provide robust security, performance, and reliability for network environments of all sizes.



PIX 501 3DES Bundle
RENTSMART $10.79 PER WEEK>
Websearch Code 198989 **$984**

PIX 501 DES Bundle
RENTSMART $10.79 PER WEEK>
Websearch Code 198978 **$984**

Computer Products at Rock Bottom Prices

Belkin USB 2.0 5 port Hi-Speed PCI Card

Belkin's Hi-Speed USB 2.0 card brings 480Mbps speed to USB connectivity. With a bandwidth 40 times greater than 1.1 it is the ideal interface for transferring large amounts of data from USB 2.0 compliant products. 4 external and 1 internal port.



$55

Websearch Code 130988

Belkin USB 2.0 FireWire PCI Card

This PCI card adds 3 USB 2.0 ports and 2 FireWire ports to your PC, providing you with the ideal interface for transferring extremely large files from USB 2.0 and FireWire peripherals.



$125

Websearch Code 192588

Belkin Hi-Speed USB 2.0 Notebook Card

A quick installation provides two 480Mbps ports - simply slide the card into your CardBus Card Type II slot. The Card offers Plug-and-Play setup, and works seamlessly with Windows machines. Instantly connect next-generation scanners, printers, high speed storage device, and video cameras.



$135

Websearch Code 191705

Belkin SurgeMaster

A power surge or lightning strike can destroy your electronic equipment in an instant. The SurgeMaster range offers the best protection for all your sensitive electronic devices in your home or office. No amount of thunder and lightning will ever be able to scare away your protection. Be safe and smart; choose a SurgeMaster with telephone/data line protection and if you want to protect your AV equipment with coaxial connection, choose the surge protector that protects both.

Websearch	BEL176	Belkin 4 Way Telephone Pro	$49
Websearch	194724	Belkin 6 Way Telephone Pro	$95
Websearch	BEL182	Belkin 6 Way Telephone Pro + AV	$119
Websearch	190488	Belkin 8 Way Telephone Pro	$119
Websearch	190655	Belkin 8 Way Telephone Pro + AV	$145



Belkin Access Point

Belkin networking presents its latest innovation, the 54g Wireless Network Access Point (WAP). The 54g WAP connects to your network switch and lets you join your wireless-equipped PCs to your wired network.

- Transfer speeds up to 54mbps
- 3 minute Smart Setup Wizard
- Lifetime warranty
- Win/Mac



NEW

$259

Websearch Code 196292

Belkin Wireless Cable/ ADSL Router

54g technology is the easiest wireless network to implement. The Gateway Router uses the wireless 54g 2.4GHz standard to offer you the widest working range up to 1800 feet and greater interoperability in mixed network. Uses NAT firewall to protect network from outside intrusions by hackers.

- Transfer speeds up to 54mbps
- 3 minute Smart Setup Wizard
- Lifetime warranty
- Win/Mac



NEW

$279

Websearch Code 196297

Belkin Bluetooth USB Adapter

The Bluetooth USB Adapter from Belkin lets you create cable-free connections between your USB desktop PC and devices using Bluetooth wireless technology.

- **10m Range $89**



NEW

100m Range

Websearch Code 196273

$145

Belkin Wireless Desktop Network Card

The 54g Wireless Desktop Network Card features breakthrough 54g technology that makes wireless file transfers and downloads faster than ever before.

- Transfer speeds up to 54mbps
- 3 minute Smart Setup Wizard
- Lifetime warranty
- Win/Mac



NEW

$139

Websearch Code 196290

Belkin Wireless Notebook Network Card

Belkin networking presents its latest innovation, the 54g Wireless Notebook Network Card. The Card works as an ideal standalone to give you instant networking capabilities.

- Transfer speeds up to 54mbps
- 3 minute Smart Setup Wizard
- Lifetime warranty
- Win/Mac



NEW

$139

Websearch Code 196291

Belkin USB 2.0/1.1 4-Port Hub

USB 1.1 Hub offers fast 12Mbps data rate for PC and Mac. USB 2 Hub (not pictured) features operation at 40 times faster than USB 1.1 and works seamlessly with today's USB 1.1 devices (PC only). Includes Belkin Lifetime Warranty and technical support.



USB 1.1 4 Port Hub

Websearch Code 189488

$48

USB 2.0 4 Port Hub

Websearch Code 193964

$75

Belkin Wireless Keyboard & Mouse

Offers advanced input at the best price point imaginable. In this finely constructed, easy-to-use wireless solution, we've incorporated a patented auto-synchronization technology and 256 IDs.



$75

Websearch Code 193161

Belkin USB 8-in-1 Media Reader/Writer

The Belkin USB Reader/Writer for CompactFlash I, CompactFlash II, SmartMedia, Secure Digital, MultiMedia, IBM Microdrive, Memory Stick, and Memory Gate Memory Stick lets you drag and drop files, images, and music for editing and storage to your Mac or PC



$65

Websearch Code 194356

Belkin Hi-Speed USB 2.0 DVD Creator

This great innovation from Belkin lets you capture and edit movies from a variety of analog video sources. The package includes the powerful Ulead movie-editing and DVD-authoring software that lets you add professional-quality soundtracks and titles, as well as stunning effects.



$159

Websearch Code 196274

CAN THE DEAL GET BETTER?
Call 1300 300 003 or visit; www.iewit.com.au
as prices may change due to daily fluctuations
and online discounts.

VISA MasterCard EXCLUSIVE DISTRIBUTOR RENTSMART

NetComm ADSLModem Router with Ethernet and USB Port - NB1300

Features:

Ethernet ADSL Modem with full integrated Router. 10/100 Ethernet and USB ports. Fully ACA (A-Tick) & Telstra (IP1149) approved. Compatible with all major ISPs and all USB supported operating Systems. Embedded PPPoE - no need to purchase additional connection software. NAT security to protect your computers from internet attack.



Webcsearch Code 193365 **$165**

NetComm Cable/ADSL Wireless Router - NB3000

Features:

Bridge between wired and wireless LANs. 11Mbps IEEE 802.11b Wireless Access Point. 4 Port 10/100 switch to build or expand your wired network. Router to share your cable or ADSL connection. NAT firewall to protect your PC's. Built -in DHCP server Supports VPN pass-through (IPSEC & PPTP). Remote administration via the internet. Compatible with PC, Mac, Linux and any TCP/IP system.



Webcsearch Code 193302 **$249**

NetComm NP2005 5 Port 10/100 Smart Switch

Features:

5-Port mini N-Way high speed switch. Auto detect full or half duplex, store and forward architecture, Plug and Play configuration in rugged metal case with Auto Sensing for uplink & external power supply.

8 Port 10/100 Smart Switch $139



Webcsearch Code NET243 **$85**

Chicony Entry Level Keyboard

(KB-9810)

- Entry level keyboard.
- Compact size design.
- User friendly ACPI function keys arrangement.



$19.95

Webcsearch Code 191402

NetComm NB2800 ADSL/Cable Router

Features:

The NB2800 ADSL/Cable Router and integrated 4-port network switch makes sharing your broadband connection simple to setup, use and maintain.

Eliminate the need to run your ISP's software to connect to the Internet as all ISP configuration settings are entered via a simple web browser page and are then stored in the NB2800.



Webcsearch Code 196248 **$149**

NetComm CD2003 Mega-i-Modem 56K External Serial Modem

Features:

56K speed and efficiency, backed by the quality of the NetComm name. The Mega-i-Modem is an entry-level communications device, allowing you to browse the web and keep in touch via email with speed and reliability.



Webcsearch Code 195317 **$89**

NetComm IN5699 Internal V92 56K Modem

Features:

Now on an elegant red and gold circuit board, the new, updated, InModem 56K delivers high-speed voice, data and fax transmission in an easy-to-install and trouble-free PCI format.

In addition to its up-to-date feature-set, the new InModem 56K features its own on board DSP (Digital Signal Processor) for top-notch CPU performance.



Webcsearch Code 130964 **$35**

Chicony USB Keyboard with 2 USB Ports

(KU-9865)

Features: integrated hub supporting two bus powered downstream ports; Plug & Play; single type connector easy to connect any USB devices; additional devices can be added with additional USB hubs.



$45

Webcsearch Code 194523

D-Link DWL-G520

Lan PCMCIA Adapter

Features:

- 802.11b standard and 802.11g draft specification
- 2.4GHz frequency range
- 64/128-bit WEP data encryption security
- IEEE 802.1 x security



Webcsearch Code 200292 **$169**

D-Link DWL-G650

Lan PCMCIA Adapter

Features:

- 802.11b standard and 802.11g draft specification
- 2.4GHz frequency range
- 64/128-bit WEP data encryption security
- IEEE 802.1 x security



Webcsearch Code 200293 **$135**

D-Link DWL-2000AP

Lan Access Point

Features:

- 10/100Mbps LAN Port
- 802.11b standard and 802.11g draft specification
- 2.4GHz frequency range
- 64/128-bit WEP data encryption security
- IEEE 802.1 x security



Webcsearch Code 200294 **$309**

MS Trackball Optical

The First Trackball with IntelliEye Optical Technology. The IntelliEye optical sensor tracks the movement of the ball 1,500 times per second to give you unbelievably smooth, precise control. Browse easily with the programmable forward and back buttons. Scroll efficiently with the wheel. The shape supports your hand in a natural posture. The thumb-operated ball is positioned for control and easy navigation. Win/Mac.



$79

Webcsearch Code 197046

D-Link DI-704P

IP Router for DSL/Cable Modem with Firewall

Ethernet Broadband Gateway with a built-in four-port switch plus a print server function.

Features:

- 10Mbps Ethernet Port for DSL or Cable Modem connection
- 4-Port 10/100Mbps Switch
- Support NAT for Firewall Protection, Intergrated Printer Server.



Webcsearch Code 190311 **$155**

D-Link DSL-504

ADSL Router with 4-Port 10/100Mbps Switch

Features:

- Connect single or multiple PC's on an Ethernet LAN to an ADSL service
- 4-Port 10/100Mbps Switch
- ADSL Interface (RJ11)
- Supports G.dmt
- IP Routing with Transparent Bridge
- Supports NAT & DHCP
- Admin through Windows based program, Telnet or Web Browser
- Telstra Approved



Webcsearch Code 190690 **$339**

D-Link DI-614+

AirPlus Enhanced 2.4GHz Wireless Router

Features:

- Capable of data transfer rates up to 22 Mbps
- Creating your first wireless network
- Quickly and securely connect computers to share a high-speed Internet connection
- Connection of up to four computers
- Connect to the network using 64, 128, or 256-bit encryption
- Four port switch built in.



Webcsearch Code 192551 **$299**

Computer Products at Rock Bottom Prices

o2 XDA

Access the Internet, make a call, send an e-mail, organise your diary. Combines full-colour touch screen with Microsoft Pocket PC 2002 operating system. Intel Strong ARM 32-bit processor, 64MB RAM, 32MB ROM, memory expansion SD card: MMC, wireless connection GSM (Dualband 900/1800) GPRS (Class B). Size: 18x73x129mm. Weight: 201 grams.



$1199

RENTSMART $13.14 PER WEEK>

Webcearch Code 196533

Toshiba Pocket PC e330

Records voice notes, plays music, video, 3D games, browses web and opens Office applications. Optional wired or wireless connectivity via SD cards (not included). Intel Xscale PXA-250 300MHz processor, 64MB RAM, extra bright 3.5" TFT reflective colour screen, SD card slot, InfraRed, voice record, MS Windows for Pocket PC 2002, rechargable battery.



$769

RENTSMART $8.43 PER WEEK>

Webcearch Code 194056

Toshiba Pocket PC e740

With either Wi-Fi (802.11b) wireless networking or Bluetooth wireless connectivity built-in, and stay connected across the LAN, to other devices, or through the Internet. Includes Microsoft Windows Pocket PC 2002, Intel PXA250 400MHz XScale, TFT reflective colour LCD, 64MB SD RAM (Onboard), 32MB CMOS Flash ROM, voice record, SD card slot, infrared port.



Wi-Fi

$1269

Webcearch Code 195333

Bluetooth

$1169

Webcearch Code 195331

Palm Tungsten T Handheld

Operating System: Palm OS v5.0. Processor: Texas Instruments OMAP1510 processor (an enhanced ARM-based processor). Memory: 16MB SDRAM (14MB actual storage capacity). Size and Weight: 10.2cm (12.2 open) x 7.7cm x 1.5cm; 159 grams. Features Voice Memo Button, Palm Expansion Slot and Built-in Bluetooth for wireless access to email and the Internet via a compatible mobile phone.



RENTSMART $7.66 PER WEEK>

Webcearch Code 193007

$699

Palm Tungsten C Handheld

Size and Weight: 12.2cm x 7.8cm x 1.7cm; 178 grams. Memory: 64MB (51MB actual storage capacity). Operating System: Palm OS 5.2.1. Processor: 400MHz Intel PXA255 Processor with Intel XScale Technology. Screen: 16-bit, 320x320 transflective TFT colour display. Mobile Radio: Wi-Fi Certified 802.11b Radio. Features Palm Expansion Slot, built-in keyboard, and 5-way navigator button.



RENTSMART $10.73 PER WEEK>

Webcearch Code 196168

$979

Palm Tungsten W Handheld

Combines wireless email and phone functionality. Check your preferred GSM/GPRS service provider for availability. Operating System: Palm OS 4.1.1. Display: 16-bit 320x320 reflective TFT colour display. Processor: Motorola Dragonball VZ processor, 33 MHz. Flexible Storage Capacity: Highly efficient operating system with 16MB SDRAM. (14.8 MB actual storage capacity) Size and Weight: 12.2 cm (13.7 cm including antenna) x 7.8 cm x 1.65 cm; 185 grams.



RENTSMART $12.05 PER WEEK>

Webcearch Code 195250

$1099

Palm Zire

Size/Weight: 11.2x7.4x1.6cm, 109 grams. USB connector/HotSync cable included. Monochrome display, 160x160 pixels. Motorola Dragonball EZ 16MHz Processor. Includes Address Book, Date Book, Clock, To Do List, Memo Pad, Expense, Note Pad and Calculator. Bonus game software included. Features synchronisation with desktop, Palm OS software v4.1, 2MB of memory, rechargeable lithium ion battery. Win/Mac.



Webcearch Code 192369

$229

Palm Zire 71

Palm OS 5.2.1 operating system, 16-Bit 320x320 transflective TFT colour display, Texas Instruments OMAP310 144MHz Processor (ARM), rechargeable Lithium Polymer 900mAh battery, stereo headphone jack, expansion card slot, integrated camera, 4MB of masked ROM and 16MB of SDRAM. Size: 11.4cm (closed) x 7.4cm x 1.7cm. Weight: 150 grams. Win/Mac.



RENTSMART $6.35 PER WEEK>

Webcearch Code 196602

$579

Acer 55 Handhelds

Runs on Palm OS 4.1 software. Includes Motorola DragonBall VZ 33MHz, 3" colour TFT LCD screen, 16MB SDRAM, 4MB Flash ROM, Memory Stick reader, infrared port, security password and handset lock. s65 also features MP3 playback, voice recording, built-in microphone, speaker, earphones, Audiobox software. Weighs 151 grams (s55); 153 grams (s65).

s65 $569
Webcearch 195339
RentSmart $6.24



s55

Webcearch Code 195340

$439

hp iPAQ H1910 Pocket PC

200MHz Intel PXA250 Applications Processor. Memory: 64MB RAM, 16MB NAND ROM Flash. Features transflective TFT display with LED backlight, touch screen, handwriting recognition, soft keyboard, voice recorder, infrared port, expansion slot, audio record/playback, rechargeable battery. Powered by Microsoft Windows for Pocket PC 2002. 113.3mm(H) x 69.8mm(D) x 12.8mm(W). 120 grams.



RENTSMART $6.24 PER WEEK>

Webcearch Code 196070

$569

hp iPAQ Pocket PC H3900 Series

The H3950 and H3970 both include 64MB RAM, 400MHz Intel PXA250 Applications Processor, Microsoft Windows for Pocket PC 2002, integrated SD expansion slot, TFT screen with 65K colours.

The H3950 Pocket PC features 32MB ROM, while the H3970 features 48MB ROM and integrated Bluetooth.

H3970 $1149
Webcearch 195324
RentSmart $12.59



H3950

RENTSMART $9.85 PER WEEK>

Webcearch Code 193819

$899

hp iPAQ H5450 Pocket PC

Offers a true "office in your pocket". Web access for all levels of professionals and individuals. Includes 48MB Flash ROM, 64MB RAM, 400MHz Intel XScale PXA250 Processor, Microsoft Windows for Pocket PC 2002, WLAN 802.11b, integrated Bluetooth, integrated Biometric Fingerprint Reader.



RENTSMART $13.69 PER WEEK>

Webcearch Code 193789

$1249

Sony CLIE PEGSJ33G

Features: Dragonball Super VZ Processor 66Mhz, Palm OS 4.1, 16MB RAM, backlit colour display, IrDA, Memory Stick slot, audio player, remote commander. Includes a high-resolution colour LCD screen, Jog Dial navigator and built-in Audio Player for MP3 and ATRAC3 music playback. Size (WxHxD): 72.5x107.8x22.0mm. Weight: 172 grams.



RENTSMART $7.11 PER WEEK>

Webcearch Code 196939

$649

Sony CLIE PEGNX70VG

Includes Palm OS 5 as well as an ARM-compliant Intel PXA250 200 MHz CPU, 16MB DRAM (Actual available space 11MB), 320x480 pixel colour reflective TFT with backlight, IrDA, Memory Stick slot, built-in 310,000 pixel CMOS image sensor camera. Audio: ADPCM 8kHz 16-bit mono, FM 16-note polyphony SMAF and MIDI, MP3 and ATRAC3 playback. Size (WxHxD): 72.3x136.6x23.5 mm. Weight: 220 grams.



RENTSMART $10.95 PER WEEK>

Webcearch Code 196935

$999

Sony CLIE PEGNZ90G

Features Palm OS 5, Intel PXA250 200MHz processor, 16MB RAM, built-in 2 mega pixel camera with flash and 2x digital zoom, built-in Bluetooth, IrDA, video recording (MPEG-4) and playback (MPEG-1, MPEG-4), TFT colour display (320x480 pixels), swivel LCD design, voice recorder, audio player (MP3, ATRAC3), built-in QWERTY layout keyboard, Memory Stick expansion slot. Size (WxHxD): 75x141x22.2mm. Weight: 293 grams.



RENTSMART $19.72 PER WEEK>

Webcearch Code 196935

$1799

CAN THE DEAL GET BETTER? Call 1300 300 003 or visit: www.ioxh.com.au as prices may change due to daily fluctuations and online discounts.

1300 300 003

VISA MasterCard BANKCARD MEMBER BENDIGO BANK b RENTSMART

Nokia 2100

Picture editor puts a paintbrush in your hands for creating your own picture message or screensaver. Multiple SMS sending is perfect for sending messages to all your friends. Create and manage up to 25 names in personlisable lists. Built-in games like Snake II, Space Impact and Link. Stopwatch and countdown time doubles as a portable timer so you won't forget.

Weight: 85g. Dimensions: 105.6x44.2x20.24mm.



No Contracts

Websearch Code 195204

$245

Nokia 6610

Features include functionality on 3 networks on five continents, colour display, downloadable personal applications via Java technology, MMS (Multimedia Messaging Service), GPRS (General Packet Radio Service), HSCSD (High Speed Data), WAP 1.2.1 Browser (via GRPS or CSD), integrated FM stereo radio, handsfree speaker, polyphonic ring tones, wallpaper, calculator, currency convertor, stop-watch, countdown timer,

Weight: 84g. Dimensions: 106x45x17.5mm.



No Contracts

Websearch Code 195214

$499

Nokia 5100

Features a Calorie Counter, Thermometer and Stopwatch - to keep pace with your fitness regime. The Integrated Flashlight is perfect for those adventures in the dark. Also includes automatic volume control, Multimedia Messaging Service (MMS), full colour display, polyphonic ringing tones, Java games and applications.

Weight: 104g. Dimensions 108.5x49.5x22mm.



No Contracts

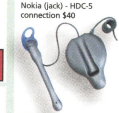
Websearch Code 197127

$562

Logitech Mobile Earbud Miniboom

Features a noise-canceling boom microphone that filters out unwanted sounds, a retractable cord for easy organization, and Logitech's patented FlexLoop cushions so you can choose the right fit for your ear.

Nokia (jack) - HDC-5 connection $40



Nokia (7 Pin) HDC-9P

$46

Websearch Code 197461

Nokia 3650

Includes integrated video recorder and player, integrated digital camera, colour display, Multimedia Messaging Services1 (MMS), 3MB user memory (Plus MultiMediaCard facility), Personal Information Management, constant and wireless connectivity, handsfree speaker.

Weight: 130 grams. Dimensions: 130x57x26mm.



No Contracts

Websearch Code 195210

$719

Nokia 6800

Stay ahead with the Nokia 6800. As you unfold it, you'll find an integrated messaging keyboard for easier input of SMS, emails and notes. It's also equipped with a high-resolution color screen for more excitement when you're Web-browsing, gaming or simply looking at pictures. The screen rotates automatically to the orientation of the keyboard when you unfold the phone.

NEW

Weight: 122 grams. Dimensions: 119x55x23mm.



No Contracts

Websearch Code 197128

$775

Nokia 7250

Includes integrated camera, MMS, pre-installed polyphonic ringing tones, colour display, synchronisation of all personal data across devices and applications over networks, tri-band GSM900/1800/19003 support, integrated stereo FM radio with hands-free speaker option, Java enabled games and applications.

Weight: 92 grams. Dimensions: 105x44x19mm.



No Contracts

Websearch Code 196406

$849

Logitech Mobile Over Ear Blue

Over-the-ear design ensures comfortable fit. Soft-touch rubber surface offers superior comfort and style. Integrated multi-function switch lets you answer and end calls or activate voice commands quickly.

Nokia (jack) - HDC-5 connection $25

Ericson - HBP-10 connection $25



Nokia (7 Pin) HDC-9P

$25

Websearch Code 197457

Telstra A50 Corded Phone

- Handsfree operation
- Call number display
- Alpha numeric display
- 13 one touch memory for speed dial
- 70 name & number memory
- Visual ring display
- Call timer
- Time clock & mute key
- Colour: Champagne



Websearch Code 195174

$88

Telstra M450 Digital Answering Machine

- 14 minutes of record time
- Date & time stamp
- Digital message counter
- Dual mail box
- Voice prompted for ease of use
- Memo facility
- Remote access
- Colour: Titanium



Websearch Code 195195

$78

Telstra BigPond Pre-Paid Internet Access

Want to experience the joys of the Internet but don't want to commit yourself to a billing method? You don't even have to nominate a credit card or Telstra account to join. No restrictions on download volumes, 5 email addresses, free customer and technical telephone support seven days a week.

196396	6 hours / 30 days	$9.95
196397	20 hours / 45 days	$19.95
196398	35 hours / 45 days	$34.95
196399	60 hours / 90 days	$54.95

Logitech Mobile Earbud

Four soft, interchangeable FlexLoop cushions come in different sizes to fit comfortably in any ear. Microphone and earpiece deliver clear sound and reception.

Nokia (jack) - HDC-5 connection $15

Ericson - HBP-10 connection $15

Standard 2.5mm jack connection $15



Nokia (7 Pin) HDC-9P

$15

Websearch Code 197453

Telstra F2100 DECT Digital Cordless Phone

- Digital voice quality & security
- Call number display (With subscription)
- 10 number name and memory
- 10 number caller list
- Pre-dialling
- Page button
- Colour: Titanium
- 1+1 includes additional cordless handset & charger

F2100 1+1 $175



Websearch Code 195177

$115

Telstra F2200 DECT Digital Cordless Phone

- Digital voice quality & security Handsfree on handset Calling number display (With subscription).
- 50 name and number memory
- 20 number caller list
- Call waiting button
- Pre-dialling
- Page button
- Multi handset compatible up to 5
- 1+1 includes additional cordless handset & charger
- Colour: Titanium

F2200 1+1 $225



Websearch Code 195178

$138

Telstra F2300 DECT Digital Cordless Phone

- Integrated digital answering machine with 13 minutes record time, dual voicemail, time & date stamp
- Handsfree on handset
- Call screening from base unit & handset
- Calling number display (With subscription)
- 20 number caller list
- Multi handset
- compatible up to 5
- 1+1 includes additional cordless handset & charger

F2300 1+1 $260



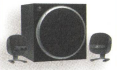
Websearch Code 195182

$175

Computer Products at Rock Bottom Prices

Logitech Z340 Speakers

This speaker system delivers the sound quality of systems costing much more while filling almost any room with clear sound. The three-piece Z-340 offers 33 watts of RMS power, 20 watts in the subwoofer and 6.5 watts in each satellite. You get thumping bass sounds along with silky smooth midrange and high frequencies.



$89

Websearch Code..... 185446

Logitech Z-560

The Logitech THX certified Z-560 4.1 surround sound system provides 400 watts of awesome power for PC games, music and DVDs. The brute force subwoofer design delivers huge, room-thumping bass while the revolutionary satellite drivers enhance mid and high-range tones. The SoundTouch Control Center lets you "fine tune" your listening environment.



$369

Websearch Code..... 189229

Logitech Z680 Speakers

The Logitech Z-680 gives you THX-certified theatre quality digital sound through optical and coaxial inputs for simple connection to nearly any audio appliance. The 5.1 configuration with Dolby Digital and DTS Decoding pumps bass through the 188-watt subwoofer and with each of the four satellites providing 62 watts (RMS) and a 69-watt centre channel you have crystal-clear midrange and high notes. This power is all available through a remote control.



$599

Websearch Code..... 194855

Microsoft Optical Mouse Blue

Use the wider scroll wheel to move through documents quickly. Features Microsoft optical technology for a smooth and accurate experience. This mouse is comfortably shaped for the right and left hand. PS2/USB. Win/Mac.



$53

Websearch Code..... 192040

Microsoft MultiMedia Keyboard

One-touch buttons take you directly to your favourite multimedia activities; navigate music and video clips, surf the Web, start the programs you use most, and more. With easy-to-use keys and custom blue accents, the Microsoft MultiMedia Keyboard adds dynamic features and vibrant looks to any desktop.



$69

Websearch Code..... 192041

Logitech Cordless Optical Mouse

Get cordless freedom and optical precision in a single, simple mouse that fits comfortably in either your left or right hand. Now just about any surface within six feet of your computer can become your workspace; no mouse pad required, no cords to clutter your desk, and no moving parts to clean. PS2/USB Win/Mac.



$75

Websearch Code..... 190584

Logitech Cordless Navigator Duo Keyboard & Optical Mouse

The Zero-Degree Tilt keyboard is designed to give you more comfort as you type. The cordless optical mouse offers greater accuracy with more comfort on almost any surface. 5 year warranty. Win/Mac.



$149

Websearch Code..... 194199

Microsoft Wireless Optical Mice

Turn your desktop into a clutter-free space with Microsoft Wireless Optical Mouse. Wireless technology, wider scroll wheel and Microsoft optical technology combine in a vibrant design. Available in Black and Blue. PS2/USB. Win/Mac.



Black

$89

Websearch Code...196174

Blue

$89

Websearch Code...191960

Microsoft Wireless Optical Desktop

Built for maximum performance and designed for maximum style. Add wireless freedom, one-touch keyboard features, customisable keys and Microsoft optical technology to your desktop. PS2/USB. Win/Mac.



$165

Websearch Code..... 192445

Logitech MX700 Cordless Optical

MX Optical Engine delivers more accuracy and control on more surfaces than ever before. Fast RF cordless technology delivers corded quality on a cordless device in a six foot range. Rapid charge base station ensures that your mouse is always ready. PS2/USB Win/Mac.



$129

Websearch Code..... 193814

Logitech Navigator Trio

This Logitech bundle is the solution that you have been waiting and looking for. Not only do you get a quality wireless keyboard and mouse that creates a clutter free desk, you also get a USB2 Quickcam Messenger Camera with up to 640 x 480 pixels resolution. PS2/USB Win.



$189

Websearch Code..... 193435

Microsoft Notebook Optical Mouse

Microsoft Notebook Optical mouse features Microsoft Optical Technology for smooth, accurate performance. Contoured for comfort and scaled-down in size, Notebook Optical Mouse is always good to go; where ever and when ever you need it. PS2/USB. Win/Mac



$59

Websearch Code..... 192444

Microsoft Wireless Optical Desktop for Bluetooth

The world's first desktop solution that delivers bluetooth technology. Work seamlessly with other bluetooth enabled devices such as compatible phones and printers, as well as your PC. Comes complete with a USB Transceiver for Bluetooth. Also features one-touch keyboard features, customisable keys and Microsoft optical technology, all in a striking design. Windows XP.



$299

Websearch Code..... 194785

Logitech QuickCam for Notebooks Pro

Bring instant messages to life, create and edit videos, capture high-quality photos, and more. The QuickCam for Notebooks Pro features an integrated notebook mount that attaches to any notebook computer and folds up for compact storage and lens protection. With its studio-quality image editing software, you can create high-impact movies anywhere with 640x480 video resolution and 1.3 megapixel photo resolution. USB Win/Mac.



$195

Websearch Code..... 191501

Logitech Quickcam Pro 4000

Combines a digital zoom, built-in microphone, and high-quality VGA CCD sensor. Create amazing videos and shoot 1.3 megapixel still photos with ease. Make live video calls, set up a video monitoring system, or send photos and video along with your email. USB Win/Mac.



$195

Websearch Code..... 190644

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as prices may change due to daily fluctuations
and online discounts.

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Iomega Zip Drives 100MB & 250MB

Reliable, versatile and cost-effective. You can choose from 100MB, 250MB configurations to protect and secure your important data.

- **100MB USB $149**
- **250MB Internal Atapi $199**



250MB USB

Websearch Code 111061

$249

Iomega 750MB Zip Drive

Iomega Zip drives come with easy-to-use software and use durable password protected disks that fit into your shirt pocket. The 750MB drive offers the ultimate in capacity, speed and security, for your business, home and enterprise needs. Chose the best drive for you; USB2, Firewire or Internal Atapi.

- **Firewire $359**
- **Atapi $219**



750MB USB2

Websearch Code 197385

$359

Iomega Hard Drives

Iomega hard drives are compact and rugged with hot plug & play capability. They deliver high capacity, flexibility and performance for today's data-intensive applications and digital video/audio files. Iomega hard drives come with Iomega Automatic Backup and Symantec Norton Ghost 2003 Disaster Recovery software to protect your files and are Mac & PC compatible to make switching easy.

- **40GB USB2 $459**
- **120GB USB2 $499**



80 MB External USB2

Websearch Code 191527

$399

Sony G-Protection CD Walkman (Blue - DEJ361L)

Features: LCD Display, G-PROTECTION Shock Resistant System, Joggable, CD-R/RW Playback Compatible, Bookmark Function, Digital Volume Control and more.



$159

Websearch Code 203888

Iomega Zip media

Iomega Zip media was a storage breakthrough when it was introduced in 1995. With large capacities of 100MB, 250MB and 750MB, Zip disks allow you to back up, transfer, secure and archive all of your critical data - all while being portable and password protected.

Websearch	Product Description	Quantity	Price
129828	Iomega Zip 100MB Disk Colour	1 Pack Mac	$19
IOM085	Iomega Zip 100MB Disk Colour	1 Pack Win	$19
IOM074	Iomega Zip 100MB Disks Gigocolour	10 Pack Mac	$165
IOM030	Iomega Zip 100MB Disks Gigocolour	10 Pack Win	$65
197201	Iomega Zip 100MB Disks Grey	10 Pack Win	$165
197204	Iomega Zip 250MB Disk Grey	1 Pack Mac	$22
IOM103	Iomega Zip 250MB Disk Grey	1 Pack Win	$22
189558	Iomega Zip 250MB Disks Grey	10 Pack Mac	$179
IOM102	Iomega Zip 250MB Disks Grey	10 Pack Win	$179
197203	Iomega Zip 750MB Disk Grey	1 Pack Win/Mac	$29
197202	Iomega Zip 750MB Disks Grey	10 Pack Win/Mac	$199



Imation CD 80min 700mb 48x + Bonus Mini CD

Imation CD-R and CD-RW media have a high-quality dye layer that ensures lower failure rates. Tested to meet Imation's exacting standards to protect against the toughest environmental conditions



$8

Websearch Code 195048

Altec Lansing Versatile 220 Speakers

For good sound at an affordable price, try the 220 system. This two-piece system works well for music and gaming.

- 11 Watts Total Continuous Power RMS (2x5.4 W/Satellites)
- 20 Watts of Total Peak Power
- Built-In Controls



Websearch Code 190463

$55

Altec Lansing Versatile 221 Speakers

Great sound with bass you can feel. This 3-piece system is a sturdy system for music and gaming that fits on your desktop and within your budget.

- 20 Watts Total Continuous Power RMS
- 50 Watts Total Peak Power
- Compact Subwoofer
- Built-In Controls



Websearch Code 190464

$109

Altec Lansing 2100 Speakers

A unique, futuristic look and the power to move you make the 2100 a terrific PC speaker system. High performance micro drivers and our ported subwoofer deliver rich, accurate sound to keep the music pumping

- 35 Watts Total Continuous Power RMS
- 50 Watts Total Peak Power
- High Performance Micro Drivers
- Ported, Dual Subwoofer Drivers



Websearch Code 190467

$199

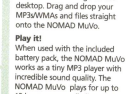
Creative Nomad MuVo 64MB

Load it!

Plug the MuVo Memory into any computer USB port and it will show up automatically as removeable storage on the desktop. Drag and drop your MP3/WMAs and files straight onto the NOMAD MuVo.

Play it!

When used with the included battery pack, the NOMAD MuVo works as a tiny MP3 player with incredible sound quality. The NOMAD MuVo plays for up to 12 hours on one alkaline AAA battery.



64MB

$275

Websearch Code 191514

128MB

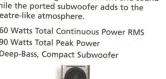
$329

Websearch Code 191515

Altec Lansing Versatile 251 Speakers

Large 3-inch drivers and a centre channel deliver a full range of movement and sound while the ported subwoofer adds to the theatre-like atmosphere.

- 60 Watts Total Continuous Power RMS
- 90 Watts Total Peak Power
- Deep-Bass, Compact Subwoofer



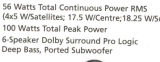
Websearch Code 193216

$229

Altec Lansing XA3051 Speakers

This top-of-the-line speaker system features a centre channel, a powerful subwoofer, and surround sound that put your TV's speakers to shame.

- 56 Watts Total Continuous Power RMS (4x5 W/Satellites; 17.5 W/Centre;18.25 W/Sub)
- 100 Watts Total Peak Power
- 6-Speaker Dolby Surround Pro Logic
- Deep Bass, Ported Subwoofer



Websearch Code 196831

$379

Altec Lansing 641 Speakers

Experience 237 watts of total continuous power (400 watts peak) over Class-D circuitry. A midrange speaker and wide-dispersion polymer tweeter assure a crisp, spectrally balanced sound. A dual-ported subwoofer delivers deep, sustaining bass that brings your favourite games and music to life.



Websearch Code 190469

$495

Computer Products at Rock Bottom Prices

Nexdisk USB Storage Device

USB 1.1 / 2.0 support. No external power required. Unique features include: Password Function - Nexdisk has the ability to lock itself with password; Bootable Disk Function - Like FDD, CDR and HDD, it is independently capable of booting system. Win/Mac.



64MB
$72
Websearch Code 190376

128MB
$117
Websearch Code 190377

256MB
$119
Websearch Code 192183

LaCie Dual DVD A06

DVD+/-RW in one drive

This universal drive delivers four DVD formats in a single slim device. By combining DVD+RW and DVD-RW formats, the LaCie Dual DVD Drive delivers greater creative versatility by eliminating the need to choose one format over another. This combination drive is also capable of writing to most CD and DVD formats, which are compatible with nearly all existing DVD-players.

Create original video DVDs

Record professional-quality, personalised DVDs with your laCie Dual DVD drive and the included Sonic MyDVD Video Suite authoring software. Import video and audio footage from your DV camcorder, arrange your sequences and burn projects onto DVD or CD-Video discs. Completed DVDs can then be played back on virtually any DVD player to share among family and friends. Features FireWire and USB 2.0 ports for easy connection to any Mac or PC.



Call for Pricing

LaCie d2 52x24x52x

USB2.0 & FireWire

LaCie CD-R 52x is the fastest external CD-Recorder on the market, burning a full 700MB CD in less than 2 minutes. It comes complete in the now famous d2 casing with all software for Mac & PC, all cables and first CDR media. Silent and efficient, it is the best professional CDR/CDRW burner on the market at the most affordable price.

FireWire $285

USB2 Win Only $269



Websearch Code 183897

$315

LaCie Pocket Hard Disk

Designed for people on the move, the LaCie Pocket Drive is small enough to fit into your pocket and features a special silicone bumper and sturdy casing for proven shock protection. Extremely small, hot-plug, self-powered, cross-platform, noiseless, sturdy... LaCie Pocket Drive features also the best reliability and performances: up to 60GB in your pocket and 35MB/s speed! Using LaCie's unique U&I technology, the Pocket Drive incorporates both USB and FireWire connectors, allowing you to hot-swap it from one computer to another without rebooting.

- Hi-Speed USB 2.0 and FireWire
- Hot-Plug Mac & Windows
- Shock-Resistant design

20GB Pocket HD $349

60GB Pocket HD $565

80GB Pocket HD $659



40GB
Websearch Code 189723

$435

LaCie CD Dupli-121

Stand-alone, three-in-one device features innovative U&I technology, providing one FireWire port and one USB 2.0 port for easy connection to Mac and PC systems. No software installation required, CD duplication can begin with the touch of a single button. Ideal for copying and distributing digital data in home offices, small businesses and more.

CD Dupli-125 $3599



RENTSMART $7.99 PER WEEK*
Websearch Code 197433

$729

Sony Microvolt USB 2.0 Storage Device

Introducing a faster way to deal with your growing storage requirements. Simply plug directly into your computer's USB port, then transfer files as required. The drives feature improved Security Zone software ensuring that sensitive personal and business information is kept secure and are host powered.



64MB
$119
Websearch Code 195980

128MB
$189
Websearch Code 189993

256MB
$349
Websearch Code 189994

LaCie d2 External Hard Disks

LaCie d2 range is a professional flexible system. Made of extruded aluminium and Zamac alloy, which are the same materials used in Formula 1 cars design for their unique features: robust, lightweight and fast cooling. Kensington cable lock and power lock for better security. Front power button and blue activity led, switches on/off with your computer. Supplied with drivers for Mac and PC.

Drives can be used stacked horizontally or can be mounted in a 1U 19" rack (kit sold separately).

80GB 7200rpm USB2.0: $369
120GB 7200rpm USB2.0: $444
200GB 7200rpm USB2.0: $629

80GB 7200rpm FireWire: $375
120GB 7200rpm FireWire: $449
200GB 7200rpm FireWire: $625
400GB BD 7200 rpm: $1349
400GB is USB2.0 and FireWire and F800
500GB BD 7200rpm FireWire: $1739
500GB is USB2.0 and FireWire and F800*



Stackable



Rack mountable



Lockable with a kensington keylock

*F800 is a new FireWire interface doubling transfer rate -up to 100MB/s- of current FireWire interface. Requires specific F800 card to take advantage of the performance.

LaCie Multi Card Reader

- Supports six types of media
- Plug and play convenience
- Compact design with versatile USB connectivity.
- An essential tool for digital photographers and marketing departments.
- Simple setup and convenient USB interface make it ideal for viewing images on a variety of digital media in both Mac and PC environments.
- Win/Mac



Websearch Code 186045

$55

LaCie Floppy Disk Drive

- Offers an ultra-thin, portable design to provide complete mobility, allowing you to move freely and take your data with you wherever you go
- Simple setup without terminators or device IDs
- Ideal for additional storage, archiving, data shuttle, and cross-platform data exchange
- Win/Mac



Websearch Code 193963

$85

LaCie Security Lock

- Protect your equipment (D2 as well as laptop) from theft and damage
- Install in just a few seconds
- Cable is resistant against cutting and pull up
- Lock cannot be forced, delivered with two numbered keys



Websearch Code 195419

$44

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Call 1300 300 003 or visit: www.jaws.com.au as prices may change due to daily fluctuations and online discounts.

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Pioneer DVR-A06 DVD-R & DVD-RW

Superior compatibility and recording performance.

The new Pioneer DVR-A06 offers reliable performance and functions that have earned their respect around the world. With faster write speeds and wider compatibility, it is time to get a DVD-R and DVD-RW drive.

Precision Recording Technology

The DVR-A06 achieves approximately ten times better overwrite performance than previous Pioneer products. It also uses an industry- first DRT-DM (Distributed Real Time Defect Management) offering a form of defect management that conforms to the DVD format without sacrificing write performance. The result is compatible writing even on discs that have been rewritten many times, without causing a degradation of disc quality. (Requires software application support.)

Pioneer PIODVRA06

High Speed DVD-/+R/RW

Includes:

Nero Express 5.5, Ulead Movie Factory SE, Video Studio 7.0 SE, DVD Picture Show SE, Burn Now, DVD Player, ReelDVD 3.0 LE TMPGEnc Plus Light
(note: does not include DVD Workshop).

Features:

Writes: DVD-R 4x, DVD-RW 2x, DVD+R 4x, DVD+RW 2.4x, CD-R 16x, D-RW 10x



Websearch Code 197387 **$492**

Pioneer PIODVRA06PRO

High Speed DVD-/+R/RW

Includes:

Nero Express 5.5, Ulead Movie Factory SE, Video Studio 7.0 SE, DVD Picture Show SE, Burn Now, DVD Player, Ulead DVD Workshop with Dolby AC-3 encoder, Video Studio 7.0 Interactive video tutorialtrial software (Media Studio Pro 7, Photo Impact 8, Cool 3D 3.5).

Features

Writes: DVD-R 4x, DVD-RW 2x, DVD+R 4x, DVD+RW 2.4x, CD-R 16x, D-RW 10x



RENTSMART $9.15 PER WEEK* Websearch Code 197390 **$835**

Sony Internal IDE 4X DVD+/-RW KIT DRU510A

Sony's latest all in-one optical drive features enhanced performance and compatibility. It records and plays both CDs and DVDs, the latter in both +R/RW and -R/RW format. Shipping as a kit, it comes with an extensive suite of Windows software for video, audio and data recording.

Features:

Record & Play CD-ROMs, CD-Audio & Video-CD Disks, Record & Play DVD-ROM & DVD Movie Disks, Supports DVD - & + Formats, 4X DVD-Recording, 4X DVD+ R & +RW Performance, 24X Max CD Recording, 16X Max CD ReWriting, 12X Max DVD Playback, 32X Max CD Playback, Easy to Install & Use, Low Power Consumption, Supports 'Mini' 80mm Media, PowerBurn Technology, Supports DVD Region Coding on Playback, Shipped with an extensive Software Suite, Windows XP Compatible

Compatibility:

Writing Formats: DVD, CD-ROM, CD-DA (CD Audio), CD Text, CD-ROM XA, CD Extra (CD+), CD-I, Video CD & UDF.

Reading Formats: DVD Video (5,9,10,18), DVD-ROM, CD-ROM, CD-DA (CD Audio), CD Text, CD-ROM XA, CD Extra (CD+), Video CD, CD-I, UDF & Photo CD (Single & Multi-session).

Media Types: 80 & 120mm CD-R & CD-RW, 74min/650MB & 80min/700MB; 120mm DVD+R, DVD+RW, DVD-R & DVD-RW

Writing Methods: Random & Sequential DVD+RW; Disc at Once, Incremental & Restricted Overwrote DVD-RW; Track-At-Once (with or without Reservation), Disc-At-Once, Session-At-Once & Packet (fixed or Variable) CD.



RENTSMART $6.69 PER WEEK* Websearch Code 196989 **$609**

RENTSMART $10.18 PER WEEK* Websearch Code 203842 **$929**

Liteon Internal 48/24/48 CDRW Kit

The LiteOn CDRW Drive includes Smartburn technology that automatically checks media quality and sets limit on burning speed to ensure successful writing sessions. The IDE drive can be installed either vertically or horizontally, has buffer underrun prevention and also a vibration absorber mechanism.



Websearch Code 193774 **$65**

52x24x52
Websearch Code 193829 **$72**

Sony External 48/12/48X USB2 CD-RW Kit

This drive features 48x speed recording and playback with buffer under-run protection, fast Audio Extraction and a unique Dual Speed operation. At 48X Max it will record a CD in around 2 minutes. Designed for use with a Desktop or Laptop, it comes with a USB cable, Win/Mac software.



Websearch Code 194705 **$319**

Imation CD-RW 40x12x40x

With this USB external CD-RW drive, it is easy to make your own music or multimedia CDs on a PC or Mac. Including a powerful software portfolio. Burn your own custom audio, music, or multimedia CDs. Record and re-record up to 1,000 times on just one Imation CD-RW disc. Easily, safely, and quickly back up files with fast recording speeds. CD-RW drives come ready-to-use.



Websearch Code 195147 **$289**

Panasonic Floppy Drive

- 1.44MB
- Horizontal or vertical mounting.
- High reliability with aluminium die cast base.
- 3 years warranty.



Websearch Code 192386 **$25**

LiteOn 52x Internal CD-ROM Drive

- 52X CD-ROM with pure-CAV technology.
- Easy-Tray design for both horizontally & vertically use.
- Gear-Driven tray disc-loading mechanism to improve reliability & life.
- Auto Balance System mechanism to reduce vibration & noise.



Websearch Code 192385 **$44**

LiteOn 16x DVD-ROM Drive

- 16X DVD-ROM & 48X CD-ROM with Pure-CAV technology
- SMART-X technology supports high speed digital audio and VCD extraction
- High speed DVD/CD playback technology to improve playability
- Easy-tray design for both horizontally & vertically use
- Gear-driven tray loading mechanism to improve reliability
- Auto balance system mechanism to reduce vibration & noise



Websearch Code 189265 **$65**

AUGUST/SEPTEMBER 2003

Computer Products at Rock Bottom Prices

Century CD Storage

Century CD is the industry's first affordable, intelligent CD and DVD storage unit, providing the user with a 100 disk capacity per unit. Manages up to 127,000 disks from a single interface on your PC.



$289

Websearch Code 197141

Sony 68CM Wega TV

(KVXJ29M31)

Sony 68cm XJ Series Flat Display Trinitron Wega TV. Features: Multi-System Tuner (PAL/NTSC/SECAM), Comb Filter (NTSC only), Wide mode (V Compression), Teletext, Power VM, Intelligent Picture III, Auto Program, Picture Rotation, Child Lock, Favourite Channel.



$1125

Websearch Code 207095

Sony DVD Player CD-RW MP3 Player

(DVPNS530B)

Features: 55mm Slim Design, CD-R/RW & MP3-CD Playback, Playback dial on front panel, Digital Video Enhancer, TV Virtual Surround, DVD Video, DVD+R/RW, Video CD, DVD-R/RW (Video Mode), DVD-R/RW (VR Mode), CD,CD-R/RW, MP3 CD, Dynamic Tilt Compensation, DTS Digital Output - TV Virtual Surround, Twin Laser Pick up, Custom Picture Mode, plus more!

$269

Websearch Code 204013

Verbatim DataLifePlus CD-R 80min 52x 10 Pack

(Slim Case)

Verbatim's innovative "Super Azo" recording dye is optimised to provide stable and reliable high-speed recording and the industries widest range of compatibility for today's 52x CD-R drives. Also features a dual-protection layer that safeguards the recording layer and provides a longer archival life. Backed by Verbatim's Lifetime Warranty.



$11

Websearch Code 193846

Verbatim Digital Vinyl CD-R 80min 10 Pack

(Jewel Case)

A recordable disc designed after the popular and groovy 45-rpm record format. The colour-coded discs use Verbatim's original Azo Blue technology for superior audio writing performance on CD burners and broad read compatibility on car CD players, home audio systems and portable CD players.



$11

Websearch Code 196447

Verbatim DataLifePlus DVD-R 4.7GB 4x 1 Pack

(Jewel Case)

Capable of recording 1-4x speed. At 4x speed (44 megabits per second or about 36x CD-R performance), a 4.7GB DVD-R disc can be filled to capacity in about 15 minutes. Complies with DVD-R for general specifications, version 2.0/4x speed Rev 1.0. Lifetime warranty.



$7

Websearch Code 196289

Verbatim CD Media

Verbatim DataLifePlus CD-R disks offer the security of the proprietory Super-Azo dye layer, backed by a lifetime warranty. Verbatim DataLifePlus CD-RW offers highly reliable technology ensuring smooth switching between record/erase cycles resulting in over 1,000 re-writes. Supported by Verbatim's lifetime warranty.

Websearch	Product Description	Quantity	Price
193842	Verbatim DataLifePlus CD-R 80min 700MB 48x VSP	1 Pack Jewel Case	$1.15
193846	Verbatim DataLifePlus CD-R 80min 700MB 48x VSP	10 Pack Jewel Cases	$10
206926	Verbatim DataLifePlus CD-R 80min 700MB 52x VSP	10 Pack Slim Cases	$11
196262	Verbatim DataLifePlus CD-R 80min 700MB 48x VSP	25 Pack Slim Cases	$26
206927	Verbatim DataLifePlus CD-R 80min 700MB 52x VSP	50 Pack Spindle	$36
193848	Verbatim DataLifePlus CD-RW 74min 650MB 2x-4x	1 Pack Jewel Case	$1.95
193849	Verbatim DataLifePlus CD-RW 80min 700MB 16x-24x	1 Pack Slim Case	$1.95
193850	Verbatim DataLifePlus CD-RW 80min 700MB 2x-4x	5 Pack Slim Cases	$7
193851	Verbatim DataLifePlus CD-RW 74min 650MB 12x	5 Pack Jewel Cases	$8



Verbatim DVD Media

Verbatim's technical leadership and superior manufacturing capabilities ensure the fastest speeds with guaranteed drive compatibility.

Websearch	Product Description	Quantity	Price
196285	Verbatim DataLifePlus DVD-R 4.7GB 2x VSP	1 Pack Jewel Case	$7
196284	Verbatim DataLifePlus DVD-R 4.7GB 2x NSP	20 Pack Spindle	$115
196286	Verbatim DataLifePlus DVD-R 4.7GB 2x NSP	50 Pack Spindle	$289
196287	Verbatim DataLifePlus DVD-RW 4.7GB 2.4x VSP	1 Pack Jewel Case	$9
196289	Verbatim DataLifePlus DVD+R 4.7GB 4x VSP	1 Pack Jewel Case	$7
196448	Verbatim DataLifePlus DVD+R 4.7GB 2.4x NSP	20 Pack Spindle	$99
196288	Verbatim DataLifePlus DVD+RW 4.7GB 2.4x VSP	1 Pack Jewel Case	$9



Verbatim CopySmartPlus CD-R/DVD-R

Stand Alone Duplicators

No PC required! The CopySmartPlus Towers make stand alone manual copying easy and affordable. Simultaneous burning capability to any or all target drives at once from hard disk.

CD-R Model: Standalone 3 drive 40x max CD-R, 12x max CD-RW Duplicator Tower with built in hard disk. DVD-R Model: Standalone 3 drive 4x DVD-R, 2x DVD-RW, 16x CD-R, 8x CD-RW Tower.

3 models available with either 3, 5 or 7 target drives.



CD-R 3 Drive	DVD-R 3 Drive
$1399	**$3135**
RENTSMART $15.34 PER WEEK>	RENTSMART $30.75 PER WEEK>
Websearch Code 194859	Websearch Code 194858

Primera Bravo CD-R/DVD-R

Automated Duplicators/Printers

Bravo combines automatic, robotic-based CD or DVD duplication along with full-colour, 2400dpi disc printing - all in one compact, desktop unit. Up to 25 discs per job are automatically produced.

This model is dual-purpose. It produces both DVD-Rs at 2x speed as well as CD-Rs at 8x speed.



CD-R Drive	DVD-R/CD-R 1 Drive
$3748	**$4595**
RENTSMART $36.76 PER WEEK>	RENTSMART $42.95 PER WEEK>
Websearch Code 194856	Websearch Code 194857

CAN THE DEAL GET BETTER? Call 1300 300 003 or visit www.ixwin.com.au as prices may change due to daily fluctuations and online discounts.

VISA MasterCard EXCESS DEFERRED b RENTSMART



Imation CD Media & Diskettes

Imation CD-R and CD-RW media have a high-quality dye layer that ensures lower failure rates. Each disc is tested to meet Imation's exacting standards to protect against the toughest environmental conditions

Websearch	195048	Imation CD-R 80min 700MB 48X Slim Jewel Case 10 Pack + Bonus Mini Neon CD-R 203MB	$7.50
Websearch	195042	Imation CD-R Mini 23Min 202MB 5 Pack Neon	$7.15
Websearch	193876	Imation CD-R 80min 700MB 48x Jewel Case 5 Pack	$4.95
Websearch	194393	Imation CD-R 80min 700MB 40x Slim Jewel Case Black 20	$22.00
Websearch	194392	Imation CD-R 80min 700MB 48x Spindle 100 Pack	$55.00
Websearch	194390	Imation CD-R 80min 700MB 48x Spindle 25 Pack	$16.50
Websearch	194391	Imation CD-R 80min 700MB 48x Spindle 50 Pack	$32.50
Websearch	194395	Imation CD-R Business Card 5.5 Min 50MB White Therm.	$28.60
Websearch	195049	Imation CD-RW 74min 650MB 4X 10 Pack	$17.60
Websearch	194276	Imation CD-RW 74min 650MB 4x-10x Jewel Case 5 Pack	$9.90
Websearch	194278	Imation 3.5 inch Floppy Disks IBM Format 10 Pack	$4.95
Websearch	196270	Imation 3.5 inch IBM 40 Pack Neon Diskettes	$25.00



Imation DVD Media

Recording movies, creating interactive training, backing up or archiving massive amounts of data are a just a few options. Imation offers all the key DVD formats, like the write-once DVD+R and DVD-R media, or DVD rewritable formats like DVD-RAM, DVD+RW, and DVD-RW. DVD media is the next generation data storage solution, giving you huge storage capacities and incredible sound and picture quality.

Websearch	193918	Imation DVD+R Media 4.7GB Jewel Case 1 Pack	$8.80
Websearch	192772	Imation DVD+RW Media 4.7GB Jewel Case 1 Pack	$11.00
Websearch	194277	Imation DVD-R Media 4.7GB Jewel Case 1 Pack	$6.05
Websearch	193917	Imation DVD-R Media 4.7GB Spindle 25 Pack	$110.00
Websearch	193916	Imation DVD-RW Media 4.7BG Jewel Case 1 Pack	$8.80
Websearch	194415	Imation DVD-RAM Media 2.6GB	$25.00
Websearch	194416	Imation DVD-RAM Media 4.7GB	$25.00
Websearch	194417	Imation DVD-RAM Media 9.4GB	$41.80



Imation 4MM/8MM/AIT Tape Media

Imation 4mm and 8mm data cartridges have a usable life time of up to 2,000 passes and have lifetime-of-the-product warranty. Imation AIT cartridges have auto tracking following (ATF) system for highly accurate tape tracking. Imation Mammoth cartridges have an archival life greater than 30 years and features a 3MB per second transfer rate.

Websearch	194355	Imation Data Tape 4mm 120m DDS-2	$9.35
Websearch	192766	Imation Data Tape 4mm 125m DDS-3	$16.00
Websearch	192767	Imation Data Tape 4mm 150m DDS-4	$28.00
Websearch	194261	Imation Data Tape AIT 2 8mm 230m 50GB/100GB	$121.00
Websearch	194474	Imation Data Tape AIT 3 8mm 100/260GB	$159.50
Websearch	194473	Imation Data Tape Mammoth 170M 8mm 20GB/40GB	$110.00
Websearch	194482	Imation Cleaning Cartridge for 4mm Tape Drives 30-50 Cleans	$14.30
Websearch	194483	Imation Cleaning Tape for Mammoth Drives	$40.70



Imation Data Cartridges

Travan and SLR technology offers businesses a reliable, cost-effective tape backup and storage solution. With a clear migration path and strong industry commitment of tier-one OEMs, Travan and SLR technology is the optimal backup solution for the growing data storage needs of your business.

Websearch	194411	Imation Data Cartridge SLR 26GB	$104.50
Websearch	194412	Imation Data Cartridge SLR 40GB	$96.80
Websearch	194408	Imation Data Cartridge SLR 5 4/8GB	$60.50
Websearch	194471	Imation Data Cartridge SLR 60GB	$121.00
Websearch	193196	Imation Data Tape Travan 40GB	$85.80
Websearch	130023	Imation Data Tape Travan 5GB 2.5GB/5GB	$38.50
Websearch	194263	Imation Data Tape Travan NS20 10/20GB	$71.50
Websearch	194484	Imation Cleaning Kit for MLR/SLR Drives	$71.50
Websearch	194481	Imation Cleaning Kit for Travan Tape Drives	$66.00



Imation DLT/SDLT and Ultrium (LTO) Tape Cartridges

Imation DLT, SDLT and Ultrium Tape Cartridges all feature lifetime-of-the-product warranty. As capacity requirements grow, your network and data centres require reliable media to store more and more data faster.

Websearch	192707	Imation Data Tape DLT IV 20/80GB (drive dependent)	$75.00
Websearch	194262	Imation Data Tape Super DLT 160/320GB (drive dependent)	$162.00
Websearch	192768	Imation Data Tape LTO Ultrium 100/200GB (drive dependent)	$105.00
Websearch	196261	Imation LTO Ultrium Gen 2 200GB/400GB Cartridge	$230.00
Websearch	194487	Imation Cleaning Cartridge for DLT Tape Drives 20 Cleans	$71.50
Websearch	194486	Imation Cleaning Cartridge for SDLT Tape Drives 20 Cleans	$180.00
Websearch	194488	Imation Cleaning Cartridge for Ultrium Tape Drives 15-20 Cleans	$176.00

Imation SoniX CD/DVD Label Kit

This all-in-one CD/DVD label kit includes everything you need to label your multimedia creations. Each kit includes software featuring more than 500 designs, matte-quality, photo-quality and Glow-in-the-Dark printable label sheets, and an easy-to-use applicator.



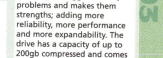
1 Pack

$19.95

Websearch Code 194279

HP SureStore Ultrium 215 Internal Tape Drive

The SureStore Ultrium 215 attacks your biggest backup problems and makes them strengths; adding more reliability, more performance and more expandability. The drive has a capacity of up to 200gb compressed and comes with a three year HP warranty.

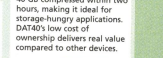


$6999

Websearch Code 195097

HP SureStore DAT40i 40GB DDS4 Tape Drive

The HP Surestore DAT40 provides reliable, cost-effective data protection for entry-level to mid-range servers and high-end workstations where backup speed is an issue. The world's fastest DDS-4 drive, it stores 40 GB compressed within two hours, making it ideal for storage-hungry applications. DAT40's low cost of ownership delivers real value compared to other devices.



$1949

Websearch Code 195091

Sony CS5 Ultra Compact LCD Projector
(1800 ANSI Lumens, SVGA)

3 LCD-panels, 1 lens projection system. LCD panel: 1,440,000 pixels (480,000 pixels x 3). Projection lens: 1.2 times zoom lens, F1.8. Lamp: 165W UHP lamp. Light output: 1800 ANSI lumens (High Mode), 1600 ANSI lumens (Low Mode). Colour system: NTSC, PAL, SECAM, NTSC4.43. Video: 600 TV lines. Resolution:800x600 pixels. Colour: Pearl white. Weight: 2.7kg.



$3449
RENTSMART $33.83 PER WEEK*
Webcsearch Code 195223

Sony CX5 Ultra Compact LCD Projector
(2000 ANSI Lumens, XGA)

3 LCD panels, 1 lens projection system. LCD panel: With Micro Lens Array, 2,359,296 pixels (786,432 pixels x 3). Projection lens: 1.2 times zoom lens, F1.8. Light output: 2000 ANSI lumens (High Mode) 1800 ANSI lumens (Low Mode). Colour system: NTSC, PAL, SECAM, NTSC4.43. Video: 750 TV lines Resolution:1024x768 pixels. Colour: Pearl white. Weight: 2.7kg.



$5099
RENTSMART $46.48 PER WEEK*
Webcsearch Code 195224

Verbatim Card Reader

This Verbatim card reader is an internal USB 2.0 device that fits into a standard 3.5" drive bay. It is equipped with four sockets to support SecureDigital Card, MultiMedia Card, Memory Stick, 3.3V SmartMedia Card, CompactFlash and CompactFlash+ (including Microdrive). You can easily write/read data to/from the storage cards or exchange data between different cards. Win/Mac



$93
Webcsearch Code 205163

Canon MV600i Digital Video Camera

Video system: Mini DV/PAL. Image sensor type: 1/6-inch interlaced CCD. LCD colour screen: 2.5-inch / approx. 112,000 pixels. Still image mode: Yes (on tape only). Image Stabilizer: Yes. Zoom ratio: 18x (optical). Digital zoom: 360X. Lens focal length: 2.8-50.4mm (54-972mm in 35mm format). Autofocus: TTL-type AF, manually adjustable. Includes IEEE 1394 terminal. Dimensions (WxHxD): 58x103x147mm. Weight: 520g.



RENTSMART $9.53 PER WEEK* **$869**
Webcsearch Code 186665

Canon MV6iMC Digital Video Camera

Stylish and ultra compact DV Camera with Canon 10x zoom lens. High resolution 800k pixel CCD and DIGIC DV signal processing for outstanding image quality. SD memory card, fast USB interface and complete Canon software bundle. Canon DV Messenger software to use the MV6i MC as a sophisticated webcam with Microsoft Windows Messenger through IEEE1394. Dimensions (WxHxD): 50x111x89mm. Weight: 380g. Win/Mac.



RENTSMART $18.08 PER WEEK* **$1649**
Webcsearch Code 207074

Canon MVX150i Digital Video Camera

Slim and stylish 1.3 megapixel DV camera with large 3.5 inch LCD screen. High resolution Canon 16x zoom lens with Image Stabilizer. High resolution 1.3 megapixel CCD and MACS signal processing for outstanding video and stills. Advanced multimedia features including USB interface, SD memory card and Direct Print. Dimensions (WxHxD): 75x92x186mm. Weight: 620g. Win/Mac.



RENTSMART $18.84 PER WEEK* **$1719**
Webcsearch Code 186668

Sony MiniDV DCRTRV19 Handycam

Offers a powerful combination of digital video, digital audio, and USB streaming at an amazing value. With Carl Zeiss Vario-Sonnar lens and Advanced HAD, every shots are looking better than ever. Also features 120x/20x selectable digital zoom (10x optical) and advanced HAD.



RENTSMART $12.05 PER WEEK* **$1099**
Webcsearch Code 196383

Camcorder Tape Media



BnmmHi8

Webcsearch	Product	Price
195359	Sony 90min Video 8 MP Standard Grade Tape (P590MP3)	$10
195360	Sony 90min Video 8 /60min Digital 8 MP High Grade Tape (P590HG3)	$13
195361	Sony 90min Video 8 /60min Digital 8 MP Standard Grade Tape (P590HMP3)	$15
195362	Sony 90min Video 8 /60min Digital 8 Metal Evaporated Tape (E590HME2)	$26
195363	Sony 60min Digital 8 MP Standard Grade Tape (N860P2)	$15
195364	Sony 90min Digital 8 MP Standard Grade Tape (N890P2)	$24

MiniDV

Webcsearch	Product	Price
195365	Sony 60min MiniDV Premium Grade Tape (DVM60R3)	$13
195366	Sony 60min MiniDV Excellence Grade Tape (DVM60EX)	$28
195367	Sony 60min MiniDV Excellence Grade Tape + IC Memory (DVM60EXM)	$47

MicroMV

Webcsearch	Product	Price
19536B	Sony 60min MicroMV Tape (MGR60)	$25

Smart Media Cards

Webcsearch	Description	Price
205151	Pretec 16MB Smart Media Card	$22
205193	Pretec 32MB Smart Media Card	$29
205196	Pretec 64MB Smart Media Card	$47
205225	Pretec 128MB Smart Media Card	$85



Secure Digital Cards

Webcsearch	Description	Price
205192	Pretec 32MB Secure Digital Card	$44
205195	Pretec 64MB Secure Digital Card	$63
205222	Pretec 128MB Secure Digital Card	$104
205319	Pretec 256MB Secure Digital Card	$179



Multimedia Picture Cards

Webcsearch	Description	Price
194853	Kodak 32MB Multimedia Picture Card	$47
190268	Kodak 64MB Multimedia Picture Card	$69
195347	Kodak 128MB Multimedia Picture Card	$115
205324	Pretec 32MB Multimedia Picture Card	$38
205332	Pretec 64MB Multimedia Picture Card	$59
205223	Pretec 128MB Multimedia Picture Card	$89



Compact Flash Cards

Webcsearch	Description	Price
197059	Kodak 32MB Compact Flash Card	$47
197045	Kodak 64MB Compact Flash Card	$59
191369	Kodak 128MB Compact Flash Card	$79
197057	Kodak 256MB Compact Flash Card	$139
204999	Pretec 32MB Compact Flash Card	$31
205121	Pretec 64MB Compact Flash Card	$47
205149	Pretec 128MB Compact Flash Card	$68
197496	Pretec 256MB Compact Flash Card	$111
205194	Pretec 512MB Compact Flash Card	$265
205159	Pretec 1GB Compact Flash Card	$469



Memory Sticks

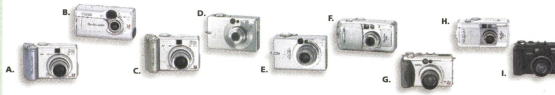
Webcsearch	Description	Price
SONY87	Sony 16MB Memory Stick	$44
SONY83	Sony 32MB Memory Stick	$59
SONY84	Sony 64MB Memory Stick	$91
191855	Sony 128MB Memory Stick	$149
203998	Sony 256MB Memory Stick Pro	$333
203999	Sony 512MB Memory Stick Pro	$619
204000	Sony 1GB Memory Stick Pro	$1199



CAN THE DEAL GET BETTER?
Call 1300 300 003 or visit: www.tsart.com.au as prices may change due to daily fluctuations and online discounts.

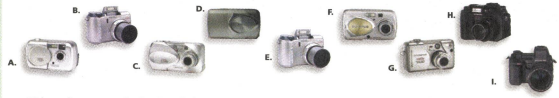
VISA MasterCard EQUITY ACCESS b RENTSMART

Canon Digital Cameras



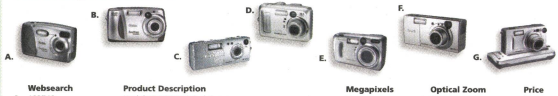
	Websearch	Product Description	Megapixels	Optical Zoom	Price
A.	196154	Canon PowerShot A60 Digital Camera	2	3x	$509
B.	196664	Canon PowerShot A300 Digital Camera	3.2	No	$419
C.	196838	Canon PowerShot A70 Digital Camera	3.2	3x	$589
D.	196902	Canon PowerShot Digital IXUS II Digital Camera	3.2	2x	$749
E.	196153	Canon PowerShot Digital IXUS 400 Digital Camera	4	3x	$899
F.	195757	Canon PowerShot S45 Digital Camera	4	3x	$935
G.	194358	Canon PowerShot G3 Digital Camera	4	4x	$1169
H.	195970	Canon PowerShot S50 Digital Camera	5	3x	$1169
I.	197557	Canon PowerShot G5 Digital Camera	5	4x	$1329

Olympus Digital Cameras



	Websearch	Product Description	Megapixels	Optical Zoom	Price
A.	197294	Olympus C-150 Digital Camera	2	No	$239
B.	197290	Olympus Ultra Zoom 740 Digital Camera	3.2	10x	$899
C.	197295	Olympus Zoom C-350 Digital Camera	3.2	3x	$559
D.	197296	Olympus MJU-300 Digital Camera	3.2	3x	$719
E.	197291	Olympus Ultra Zoom 750 Digital Camera	4	10x	$1099
F.	197297	Olympus MJU-400 Digital Camera	4	3x	$899
G.	197298	Olympus Zoom C-50 Digital Camera	5	3x	$1099
H.	197292	Olympus Zoom C-5050 Digital Camera	5	3x	$1549
I.	197293	Olympus Pro E-20 Digital SLR Camera	5	4x	$2399

Kodak Digital Cameras



	Websearch	Product Description	Megapixels	Optical Zoom	Price
A.	193748	Kodak CX4200 Digital Camera	2	No	$269
B.	197123	Kodak CX4230 Digital Camera	2.1	3x	$369
C.	190242	Kodak LS-420 Digital Camera + Dock	2.1		$639
D.	202127	Kodak CX6330 Digital Camera	3.1	3x	$549
E.	197565	Kodak Easyshare DX6340 Digital Camera	3.1	4x	$639
F.	197040	Kodak Easyshare LS633 Digital Camera	3.3	3x	$725
G.	193160	Kodak LS-443 Digital Camera	4	3x	$919

Sony Digital Cameras



	Websearch	Product Description	Megapixels	Optical Zoom	Price
A.	195421	Sony DSCP32 Cybershot Digital Camera	3.2	No	$439
B.	195422	Sony DSCP52 Cybershot Digital Camera	3.2	2x	$569
C.	195423	Sony DSCP72 Cybershot Digital Camera	3.2	3x	$615
D.	196332	Sony DSCP85 Cybershot Digital Camera	3.2	3x	$749
E.	196858	Sony DSCFX77 Cybershot Digital Camera	4	No	$999
F.	196327	Sony DSCF717 Cybershot Digital Camera	5	5x	$1729
G.	196333	Sony DSCP92 Cybershot Digital Camera	5	3x	$899
H.	196373	Sony DSCV1 Cybershot Digital Camera	5	4x	$1269
I.	196330	Sony DSCP10 Cybershot Digital Camera	5	3x	$999

Crumpler bags

All Crumpler bags come in a range of colours and with the following features:

- Original 1000 D cordura nylon
- Heady duty padding
- External zip pockets
- Padded shoulder strap
- Escape hole for audio or communication devices
- Quick release buckles and laptop stabiliser

Roll-O-Notes
W x H x D: 47 x 27 x 12cm.
Holds up to: 14.1" screen



$119
Websearch Code 203668

Wack-O-Phone
W x H x D: 47 x 33 x 16cm.
Holds up to: 15.1" screen



$144
Websearch Code 203674

Very Busy Man
W x H x D: 55 x 36 x 20cm.
Holds up to: 16" screen



$164
Websearch Code 191487

Computer Products at Rock Bottom Prices

Hauppauge WinTV-USB Radio

- Watch TV in a window on your PC
- Plugs into your PC's USB port for easy installation!
- Videoconference over the Internet
- Make video movies in an AVI file format

Win TV-USB
Websearch HAU004
Price $249



$299
Websearch Code 191906

Hauppauge PVR250

Turn your PC into a Digital TV recorder, watch and record your TV shows with instant replay and program pause. The WinTV-PVR-250 brings live TV to your PC screen. With it's 125-channel cable ready TV receiver, you can watch TV in a resizeable window or full screen while you work on your PC.



$409
Websearch Code 195313

Hauppauge PVR 350

Record TV and Video material in DVD-quality MPEG2 to the PC's hard drive and play back using the PVR 350s dedicated MPEG decoding hardware to a television via a video output on the card. A true digital VCR. Comes with FM Radio.



$519
Websearch Code 195954

Swann DVD Easy

Creative analog

- Edit your old analog video tapes and convert them to DVD format
- Create professional movies using special applications
- Contents include: Analog Capture Card, Ulead VideoStudio 5 DVD Special Edition, Tutorial CD, RCA to RCA Cable and Instructions Guide.



$109
Websearch Code 192494

Swann DV HomePro

Fun for the whole family

- Apply professional video filters, transitions, titles, and audio effects to family videos or childhood memories
- Create your own soundtracks with Bonus CD
- Contents include: 3-Port FireWire PCI Card, Ulead Video Studio 6 DVD Special Edition, Tutorial CD, Soundtrack Editing software, FireWire Cable, and Instructions guide.



$139
Websearch Code 192027

Swann DV Traveller

Movie making on the go

- Video Editing solution for Notebook users
- Create quick & easy movies by applying filters, transitions, titles, and audio effects
- Contents include: FireWire PCMCIA Card, Ulead VideoStudio 6 DVD Special Edition, Tutorial CD, Soundtrack Editing software, FireWire Cable, and Instructions Guide.



$149
Websearch Code 192023

Swann Opti-Pro

USB Optical Trackball Scroll Mouse

- Precise optical sensor for accuracte smooth gliding on most surfaces
- Easy fingertip control with trackball scroll switch between trackball or scroll function
- Software included to customise middle button and control scroll speed
- Includes magnifying function



$35
Websearch Code 189594

Swann Multi-Hub

4 Port USB2 Hub

- Adds 4 USB2 ports to your PC or Mac
- Works with high powered and low powered devices
- Plug & Play and hotswapping



$65
Websearch Code 193359

SwannSmart USB

USB 56K External V.90 Modem

- Bus powered - no need for extra power supply
- "Plug & Play" simplicity
- Comes with BONUS Swann NetTools CD and Telstra's "Free Hours" Internet CD



$79
Websearch Code SWA0201

Pinnacle Studio Moviebox USB

With Pinnacle Studio MovieBox USB, home movie making has become accessible to everyone. Using the high-quality and aesthetic device, you can transfer videos easily into your PC. Use the award winning Pinnacle Studio 8 editing software to create amazing home movies and archive them onto usual videotapes or store them on CDs & DVDs.



$559
Websearch Code 196259

Pinnacle Studio Moviebox DV

Pinnacle Studio MovieBox DV comes with a high-performance, ergonomic and aesthetic hub that connects to any PC's FireWire port in order to transfer digital or analogue video sources to your PC. The award winning Pinnacle Studio 8 software then allows you to make stunning movies that you can store and share on VHS, VCD and DVD.



Doubles as an AV/DV Convertor

$635
Websearch Code 196280

Pinnacle Studio 8 Deluxe

Pinnacle Studio Deluxe delivers everything you need to make fantastic digital movies on your PC, in one easy to use package. The most advanced solution in the Pinnacle Studio range, Deluxe allows you to capture and output from and to most analogue and digital sources, and provides sophisticated software editing tools, effects and transitions.



$569
Websearch Code 191494

Pinnacle PCTV & PCTV PRO

Fully featured TV Tuner PCI cards to watch TV on a PC in ultimate image quality for an affordable price.

- Watch TV and listen to stereo radio on your PC even while using other applications.
- Capture in MPEG1 or MPEG2 and burn VCDs, SVCDs or DVDs with your CD or DVD burner
- Fully featured remote control
- Capture Stills and more.



PCTV	PCTV Pro
$125	**$225**
Websearch Code 191507	Websearch Code LAK130

Pinnacle Edition 5

Pinnacle Edition 5 takes a superior editing platform to new heights. Now with hundreds of real-time effects and DVD authoring integrated directly into the timeline, Pinnacle Edition 5 sets a new benchmark in video publishing. This further enhances the appeal of this modern, multi-threaded software which already boasts terrific picture quality, background rendering and unique InstantSave technology.



$1379
Websearch Code 196085

Pinnacle Edition Pro 5

Pinnacle's definitive solution for advanced video editors & enthusiasts. Edition 5 Pro answers all Non-linear editors' wishes for a powerful, integrated, real-time editing & DVD authoring solution for the PC. Make the switch & find out what you've been missing! Includes ATI graphics hardware with Analogue & Digital I/Os.

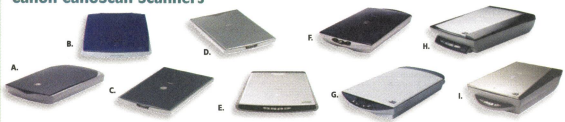


$1849
Websearch Code 196471

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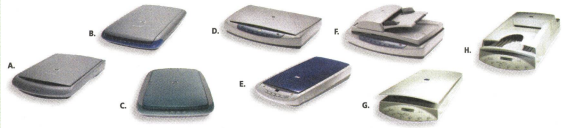
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Canon CanoScan Scanners



	Websearch	Product Description	Resolution	Connectivity	Platform	Price
A.	197336	Canon CanoScan D646Uex Scanner	600 x 1200 dpi	USB	Win/Mac	$105
B.	CAN310	Canon CanoScan N640Pex Scanner	600 x 1200 dpi	Parallel	Win	$125
C.	195688	Canon CanoScan LiDE 20 Scanner	600 x 1200 dpi	USB	Win/Mac	$144
D.	195876	Canon CanoScan LiDE 30 Scanner	1200 x 2400 dpi	USB2	Win/Mac	$199
E.	195877	Canon CanoScan LiDE 50 Scanner	1200 x 2400 dpi	USB2	Win/Mac	$219
F.	195878	Canon CanoScan 3000F Scanner with Transparency Adaptor	1200 x 2400 dpi	USB2	Win	$269
G.	194995	Canon CanoScan 5000F Scanner with Transparency Adaptor	2400 x 4800 dpi	USB2	Win/Mac	$349
H.	195547	Canon CanoScan 8000F Scanner with Transparency Adaptor	2400 x 4800 dpi	USB2	Win/Mac	$529
I.	195879	Canon CanoScan 9900F Scanner with Transparency Adaptor	3200 x 6400 dpi	USB2/Firewire	Win/Mac	$699

Hp Scanjet Scanners



	Websearch	Product Description	Resolution	Connectivity	Platform	Price
A.	190503	hpScanjet 2300c Scanner	600 x 1200 dpi	USB2	Win/Mac	$135
B.	190504	hpScanjet 3500c Scanner	600 x 1200 dpi	USB2	Win/Mac	$175
C.	190505	hpScanjet 3570c Scanner with Transparency Adaptor	600 x 1200 dpi	USB2	Win/Mac	$265
D.	191416	hpScanjet 4500c Scanner	2400 x 2400 dpi	USB2	Win/Mac	$349
E.	191417	hpScanjet 4570c Scanner with Transparency Adaptor	2400 x 2400 dpi	USB2	Win/Mac	$475
F.	191415	hpScanjet 5550c Scanner	2400 x 2400 dpi 35pg Auto Doc Feeder	USB2	Win/Mac	$869
G.	HP5048	hpScanjet 7400c Scanner with Transparency Adaptor	2400 x 2400 dpi	USB/SCSI	Win/Mac	$969
H.	HP5050	hpScanjet 7450c Scanner with Transparency Adaptor	2400 x 2400 dpi 50pg Auto Doc Feeder	USB/SCSI	Win/Mac	$1399

Epson Perfection/Expression Scanners



	Websearch	Product Description	Resolution	Connectivity	Platform	Price
A.	190687	Epson Perfection 1260 Scanner	1200 x 2400 dpi	USB	Win/Mac	$165
B.	190734	Epson Perfection 1260 Photo Scanner with Transparency Adaptor	1200 x 2400 dpi	USB	Win/Mac	$229
C.	190688	Epson Perfection 1660 Photo Scanner with Transparency Adaptor	1600 x 3200 dpi	USB2	Win/Mac	$355
D.	190735	Epson Perfection 2400 Photo Scanner with Transparency Adaptor	2400 x 4800 dpi	USB2	Win/Mac	$489
E.	196101	Epson Pefefection 3200 Photo Scanner with Transparency Adaptor	3200 x 6400 dpi	USB2/Firewire	Win/Mac	$765
F.	EPS457	Epson Expression 1680 Scanner	1600 x 3200 dpi	USB/SCSI	Win/Mac	$2049
G.	197343	Epson Expression 1640XL A3 Scanner	1600 x 3200 dpi	USB/SCSI	Win/Mac	$5390

Syscan TravelScan 860

The TravelScan 860 is a business card scanner which interfaces to any standard USB port. It is bundled with Syscan BCR business card software providing first-class business card recognition and ease of use.

Automatically perform text recognition of the card (OCR) and save both the text and the image.



$275

Websearch Code 190180

Syscan TravelScan 464

At only 335 grams, the TravelScan 464 seems like a light weight but it packs plenty of punch. It features USB 2 interface, 600 optical resolution and the versatile PageManager 6 document management software. Scan an A4 page in as little as 25 seconds. Free from clumsy power adaptors: plugs straight into your PC's USB port.



$309

Websearch Code 195856

Microtek SM 4900

Microtek's ScanMaker 4900 represents the new price performance standard in 48-bit, 4800x2400 dpi desktop scanners, giving you the quality you really need for all your design and publishing projects. It delivers high resolution, fast scanning speeds, push-button ease-of-use and great image quality at an affordable price.



$379

Websearch Code 195855

Australia's Software Specialist

ScanSoft PaperPort Deluxe 9

Turn piles of paper and photos into organised digital files that you can quickly find, use and share. Stop wasting time looking for paper documents scattered around your home and office. End the frustration of organising, editing and sharing your digital photographs. PaperPort will keep you organised and save you time.



$165

Websearch Code 196534

ScanSoft PaperPort Pro 9 Office

The most efficient way for your organisation to organise, find and share paper, PDF, and digital documents. PaperPort Pro Office combines the power of creating PDF, the convenience of network scanning and the efficiency of document management, into a single, easy-to-use desktop application.



$299

Websearch Code 196535

ScanSoft TextBridge Pro 11

TextBridge Pro 11 is the simple and fastest way to convert paper into editable electronic documents, saving time and increasing productivity. New OCR engines are designed to deliver the most accurate TextBridge results ever - even on complex pages with graphics and tables.



Full

$149

Websearch Code 192337

Upgrade

$89

Websearch Code 192338

MYOB BusinessBasics

No need to jump between programs (such as spreadsheets and word processors) to get your business done. Now with MYOB BusinessBasics, you can run all your basic business tasks, create quotes, email invoices and enter transactions - from the one easy business program.

MYOB BusinessBasics is ideal for small or home-based businesses, offering you a number of significant time-saving features that make business management even easier, such as:

- Automated bank reconciliation
- An easy-entry transaction register

Upgrade From MYOB FirstAccounts $59



$159

Websearch Code 192542

MYOB Accounting Plus 13

MYOB Accounting Plus is for businesses that need to streamline accounts procedures and would benefit from improved inventory management, better management of customer and supplier relationships, advanced business reporting, and automated payroll or time billing.

Upgrade from MYOB FirstAccounts $375
Upgrade from MYOB Accounting 13 $245
Upgrade from MYOB Accounting (Prior to 13) $295
Upgrade from MYOB Business Basics $415



Full Version

$539

Websearch Code 196341

Upgrade

$269

Websearch Code 196343

MYOB FirstEdge - for Mac

MYOB FirstEdge is the basic business management software solution for small or home-based businesses using the Mac, that helps you to work faster and more efficiently.

- Create quotes that convert to invoices
- Track job costings and profitability
- Track your GST and automate your BAS
- Create and customise over 70 reports
- Email quotes, invoices and reports

Upgrade From MYOB FirstAccounts $59



Simple financial modelling book for small business. Valued at $24.95

$159

Websearch Code 194241

MYOB RetailManager Standard

The complete retail picture. With MYOB RetailManager Standard it's easy to keep track of every transaction in your store from sales, stock movements, GST and gross profit, right through to staff actions and even customer details.

- Process sales fast
- Build powerful customer relationships
- Produce reports at point-of-sale
- Streamline your stocktaking
- Manage your stock

Retail Manager Pro $2147



$1749

Websearch Code 192165

MYOB RetailManager Enterprise

MYOB RetailManager Enterprise streamlines multiple-store retail business management by giving you a global, centralised view of all your retail operations. Consists of two components: the 'Central' module, through which head office communicates with your various stores, and the 'Shop' module, through which each store communicates with head office.

- Streamlines multiple-store retail business management.
- Consists of 'Central' and 'Shop' modules.
- Enables head office communication with retail outlets.
- Retail business management reports.



Enterprise Edition

$1839

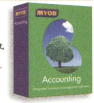
Websearch Code 192167

MYOB Accounting 13

MYOB Accounting is for businesses that need to streamline accounts procedures and would benefit from improved inventory management, better management of customer and supplier relationships and advanced business reporting.

- Streamline accounts procedures
- Comprehensive business management
- Powerful inventory management
- Contact management

Upgrade from MYOB FirstAccounts $265
Upgrade From MYOB Business Basics $290



Full Version

$299

Websearch Code 196340

Upgrade

$239

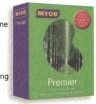
Websearch Code 196342

MYOB Premier 7

MYOB Premier is for businesses that need to streamline accounts procedures, whether through simplifying complex inventory issues, running an automated payroll, time billing, accessing advanced reporting or increasing productivity with multi-user access.

MYOB Premier's combination of productivity enhancing features will appeal to any business that has complex inventory requirements. Works with more than one currency, or requires multi-user access.
Also includes 1 full year of MYOB Support Licence.

Upgrade from MYOB FirstAccounts $1275
Upgrade from MYOB Accounting $1145
Upgrade from MYOB AccountingPlus $900
Upgrade from MYOB Business Basics $1315



$1379

Websearch Code 195515

MYOB AccountEdge 3

MYOB AccountEdge is the ideal accounting and business management software solution for businesses using the Mac.

- Maintain accurate accounts
- Process sales and purchases
- Track your inventory and your money
- Process your payroll
- Track your billable time
- Build better customer and supplier relationships

Upgrade from MYOB FirstAccounts $295
Upgrade from MYOB Accounting $295
Upgrade from MYOB AccountingPlus $295
Upgrade From MYOB FirstEdge $415
Upgrade from MYOB Premier $295



$545

Websearch Code 196352

MYOB RetailManager and Sign IQ 5 Bundle

Streamline your retail point of sale functions whilst gathering valuable data that assists you in managing your retail business with MYOB RetailManager Standard. Capture data that improves your understanding of the way your business is tracking and gain information that allows you to drive profits. More than just a cash register.



*Available while stocks last

Combined with the Sign IQ visual merchandising solution you have the tools to best reach your customers through professional point of sale signage and labelling.

$1889

Websearch Code 193808

MYOB Pocket Accounts

MYOB PocketAccounts, a handheld sales and time billing program that helps businesses with a mobile sales or consulting force improve their efficiency and cash flow.

MYOB PocketAccounts runs on a Palm OS device and links seamlessly with MYOB accounting software on the desktop, allowing users to synchronise their entire day's data at the push of a button.

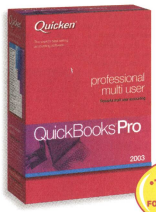


$195

Websearch Code MYO044

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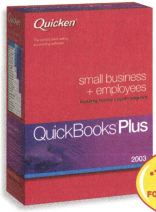
- Electronic Banking^
- Track Stock Assembly (finished goods)
- Units of Measure
- Sales order / back order tracking
- Multiple Quotes per job
- Variance tracking on Quotes
- Receipt spanning over multiple jobs
- Brand new payroll module
- New bank reconciliation control allows you to reprint by any bank record date
- And much more

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Philips 15" Flat Screen Monitor RRP $699 for customers purchasing QuickBooks Pro 2003 Full Version



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Small Business + Employees

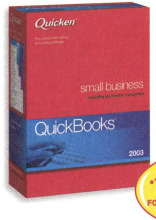
- New fully integrated Payroll. Now contained wholly within QuickBooks
- Print pay slips and cheques directly from QuickBooks Plus
- Electronic direct deposit of pay cheques
- Detailed reports and Payment Summaries
- Take care of all your Payroll and financial information in the one program
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Small Business

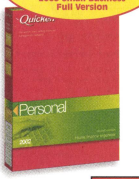
Basic accounting tools for your service needs

- Fast and easy start up
- Create invoices with one click
- Write and print cheques
- Track customer payments, expenses and liabilities

New Features for 2003 include

- Download statements to QuickBooks^
- Automatically create a budget
- More form customisation options
- Advanced options for backing up your data

FREE*
Quicken Personal 2002 SE RRP $79.95 for customers purchasing QuickBooks 2003 Small Business Full Version



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^Check with your financial institution to see if they support this feature.

PersonalPlus 2002 - Second Edition

- Track income and expenses
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- Identify your liabilities and proactively manage your debts (including mortgages)
- Track the value of your assets and know your current net worth
- Instant access to relevant financial information
- Schedule your bills and other recurring transactions
- Import and reconcile transaction statements from major banks



Full Version
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Websearch Code 189846

Upgrade
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Websearch Code 189856

ShareAnalyser

Quicken ShareAnalyser 2 is the smart way to manage your trading strategy. Learn to take control of your financial future and make your own investment decisions with confidence. Discover how investing in the stock market can be fun and extremely rewarding. Including the right blend of software, online services and educational course material, Quicken ShareAnalyser will help you develop winning investment strategies, select the right stocks and manage your portfolio to limit losses.

- Analyse the latest share data
- Powerful charting tools
- Create and monitor watch lists of shares.
- Set up alerts to notify when shares meet set prices.



$185
Websearch Code 190145

Microsoft Flight Simulator 2004

A Century of Flightcelebrates the first100years of powered flight with a collection of important historical aircraft and exciting new features that continue the traditions of realism, technological innovation, and richness that have delighted aviation enthusiasts and pilots around the world.



Call for Pricing

Money 2003

Microsoft Money 2003 Standard provides a quick and easy way to organise and manage your personal finances. Create a budget, reduce debt, balance your checkbook, pay bills and manage your home finances. Personal finance made simple.

Preorder new 2004 version coming soon.

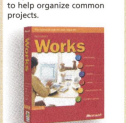


$65

Webcsearch Code 191391

Microsoft Works 7

Works 7.0 is the latest version of the popular essential home productivity software. It includes a word processor, spreadsheet, database, calendar. Plus Works has new, professionally designed templates, and a new tool to help organize common projects.



$109

Webcsearch Code 191400

Microsoft Works Suite 2003

5 full version Microsoft software titles for your home PC at one low price.

Includes:

- Microsoft Word
- Microsoft Works
- Microsoft Money Standard
- Microsoft Encarta Standard
- Microsoft Picture It!



Preorder new 2004 version coming soon.

$175

Webcsearch Code 191333

Microsoft MSDN Universal 7

Provides priority access to essential resources for developers, including timely delivery of everything you need to build XML Web services and applications. Get uninterrupted access to the latest Microsoft technologies 24 hours a day 7 days a week online and through regular CD or DVD updates.

- **Upgrade/Renewal $4444**



$5379

Webcsearch Code 130922

Microsoft Exchange 2000 Server Standard

Supporting a range of collaborative activities, including group scheduling capabilities, discussion groups, and team folders, it provides access to information across geographic, organisational, and technology barriers with features such as Instant Messaging, real-time data, and video conferencing.

Call for academic pricing.



Full 5 clients

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Webcsearch Code MSS854

Microsoft Visual Studio.Net Professional

Visual Studio.net Professional will enable developers to build next generation Internet applications that target any Internet device and integrate with any platform.

- **Upgrade $999**

Call for academic pricing.



$2049

Webcsearch Code 196754

Microsoft Publisher 2002

A business desktop publishing program designed for business users who are serious about creating their own marketing materials without the help of a professional designer.

- **Upgrade $159**

Call for academic pricing.



$259

Webcsearch Code MSS673

Microsoft Visio 2002 Std

Quickly assemble diagrams using predefined shapes - there's no need to draw. Visualise people, projects, and processes. Create flowcharts, organisation charts, timelines, office layouts, and more. Even generate diagrams from data stored in Microsoft Excel, Microsoft Access, and Microsoft Project.

- **Std Upgrade $209**

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$395

Webcsearch Code MSS685

Microsoft Small Business Server 2000

The network solution designed to help businesses with up to 50 PCs take advantage of the internet, strengthen customer relationships, and improve employee productivity. Includes Windows 2000 Server, Exchange 2000 Server, Internet Security and Acceleration Server 2000, SQL Server 2000, and more.

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Microsoft Visual Basic .net Standard

Reengineered to be a first-class language on the Microsoft .NET Framework, it provides the easiest and most productive route for new developers and existing Visual Basic programmers to quickly build Windows-based applications.

Call for academic pricing.



$215

Webcsearch Code 189799

Microsoft FrontPage 2002

Add sophisticated technology to your Web site without having to program. Whether you want to better understand your visitors through usage analysis reports, or get the lowdown on your site's performance with enhanced reports, Microsoft FrontPage 2002 has the tools to help your business. With improved interfaces and enhanced wizards you need to Front page to get a professional-looking website.

- **Upgrade $185**

Call for academic pricing.



$329

Webcsearch Code MSS679

Microsoft Visio 2002 Pro

Visio Professional 2002 provides diagramming solutions that help business and technical professionals document and communicate a broad range of ideas, information, and systems. When used to augment text and numbers, Visio diagrams make a message more concise, help people remember main points, and transcend cultural and technical barriers.

- **Pro Upgrade $499**

Call for academic pricing.



$959

Webcsearch Code MSS687

Microsoft SQL Server 2000 Standard

Relational Database Management and Analysis System. Great support for Web standards, powerful tools for system management and tuning, and exceptional scalability and reliability for your money make SQL Server 2000 the best choice for the next generation of enterprise-class database solutions.

Call for academic pricing.



Full 5 clients

$2899

Webcsearch Code 193920

Microsoft Visual C++ .net Standard

Visual C++ .NET is the most powerful C++ tool for creating the highest-performance software for Windows and the Web. Including features like, IntelliSense Technology, Edit and Continue which significantly speeds the development process.

Call for academic pricing.



$215

Webcsearch Code 190091

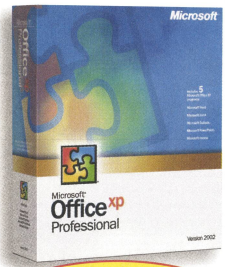
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Microsoft Office XP

The most significant version of Office ever released, Microsoft Office XP Professional integrates productivity innovations throughout its programs to transform the traditional Office suite into a smarter overall work experience.
By simplifying productivity, enabling collaboration for everyone, and extending Office beyond the desktop, Office XP streamlines how people work with information and one another, making it easier for everyone to create, share, and analyse important data.



Purchase Office XP on your new PC & SAVE approx. 65%
(see page 5 for details)

Office XP Standard

Standard Office suite features Word, Excel, Outlook and PowerPoint 2002 applications.

Call for academic pricing.

Upgrade	Full
$449	$919
Websearch Code MSS865	Websearch Code MSS864

Office XP Professional

Professional Office suite includes Word, Excel, Access, Outlook and PowerPoint 2002 applications.

Call for academic pricing.

Upgrade	Full
$639	$1119
Websearch Code MSS868	Websearch Code MSS867

Office XP Developer

Office XP Developer includes Microsoft FrontPage Web site creation and management tools, also includes developer-only versions of Microsoft SQL Server 2000 and Exchange 2000 Server.

Call for academic pricing.

Upgrade	Full
$1049	$1515
Websearch Code MSS682	Websearch Code MSS683

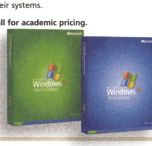
Microsoft Windows XP Home

Windows XP Home Edition is an excellent choice for most home users, with exciting new features that help you do more with your computer.

Microsoft Windows XP Professional

Windows XP Professional, provides the highest levels of performance, productivity and security. It is the best choice for business users and for home users who demand the most from their systems.

Call for academic pricing.



Home

Upgrade	Full
$215	$405
Websearch Code MSS701	Websearch Code MSS700

Professional

Upgrade	Full
$415	$595
Websearch Code MSS703	Websearch Code MSS702

Microsoft Plus! Digital Media Edition

Share your photos and enjoy your music and home movies. Create vibrant photo stories with your narration, music and photo effects. Transform your PC into a full-featured party jukebox with visual effects while protecting your personal information and restricting access to other applications. Copy your aging cassette tapes and vinyl records into clean, vibrant digital files using hiss and pop reduction, track splitting and more.



$44
Websearch Code 194802

Microsoft Project Standard

Get the tool you need to schedule, organise and analyse tasks, deadlines and resources. This is the upgrade to Microsoft's core project management program for planning and managing projects from the desktop.

Call for academic pricing.
- Upgrade $699



$1199
Websearch Code 190094

Microsoft Project Professional

This new desktop program includes all the core project management functionality of Microsoft Project Standard. Used with Microsoft Project Server 2002, it also offers powerful collaboration features, including enterprise resource management and analytical tools.

Call for academic pricing.
- Upgrade $1099



$1899
Websearch Code 190096

MS Windows Server 2003

Windows Server 2003, Standard Edition is the network operating system for small organisations and departmental use. It delivers intelligent file and printer sharing, secure Internet connectivity, centralised desktop application deployment, and Web solutions that connect employees, partners, and customers.

Call for academic pricing.
Enterprise Available.



Standard 5 Client	Standard 10 Client
$1999	$2249
Websearch Code 195945	Websearch Code 195946

Microsoft Volume Licensing

Microsoft's Open Licensing program offers benefits when purchasing or acquiring multiple copies of Microsoft software.

Designed for organisations with as few as two PCs and purchasing as few as five licenses on the initial order. Receive significant discounts over retail full packaged product prices - minimum 20%
For example:
Office XP Pro - $899 (Minimum 5 license purchases if you are a new MOLP customer).

Call our Managed Accounts team to SAVE!
1300 761 761

Microsoft Office v.X for Mac

Office v.X supports all your favorite Mac OS X features and technologies, and is completely compatible with Office 2001 for Mac, Office 98 Mac Edition, Office for MS Windows, AppleWorks 6, and FileMaker Pro 5.5.

Call for academic pricing.



Upgrade
$549
Websearch Code MSS710

Full
$899
Websearch Code MSS709

Microsoft Rise of Nations

From Brian Reynolds, designer of Civilization II and Alpha Centauri, comes Rise of Nations, combining the epic scope of Civilization with the fast-paced action of real-time strategy games. Rise of Nations allows players to create new cities, improve their city infrastructure and expand national borders.
Rated: G8+



$85
Websearch Code 195319

McAfee VirusScan 7 Home Edition

Stop viruses and keep your PC safe. VirusScan software destroys threats at all entry points to your PC including email, the Internet, and even synchronisation with your PDA.



Professional Edition
$85
Webcsearch Code 191394

Home Edition
$72
Webcsearch Code 191393

McAfee SpamKiller 4

Quickly stop spam from polluting your inbox. SpamKiller gives you ultimate control over your email by filtering out unwanted email while delivering the email that you want to receive. It helps stop spammers by notifying the sender's mail service of the offensive email.



$44
Webcsearch Code 193995

PC-Cillin 2003

Combines advanced virus detection and cleaning with an integrated firewall to safeguard your system from hackers and malicious code threats in email and instant messaging, and while surfing the Internet. New features like Wi-Fi protection helps secure your computer when connecting to a wireless LAN network, and Outbreak Alert gives you early warning about new viruses.



$75
Webcsearch Code 193158

MS Press Faster Smarter Microsoft Windows XP

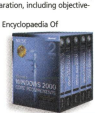
- Teaches expert tips and how-tos for performing everyday tasks and functions with the Windows XP operating system
- Uses step-by-step instructions and plenty of visual examples to deliver the facts you want-no jargon, no silly chatter
- Covers all the essentials, including setting up an internet connection, building a simple network, blocking spam, burning CDs, e-mailing digital pictures and more.



Webcsearch Code 196758 **$39**

MS Press MCSE Self Paced Training Kit Win2000 2nd Edition

- Delivers in-depth preparation for core MCSE Exams
- Fully revised and expanded study guide
- Exclusive test-readiness tool that generates timed, 50-question practice exams with automated scoring
- 200+ page exam preparation, including objective-by-objective review
- Includes the Microsoft Encyclopaedia Of Networking, Second Edition, eBook



Webcsearch Code 195914 **$355**

MS Press Introducing Microsoft .NET, Third Edition

- Provides a high-level overview of the .NET Framework, updated to reflect the release of Visual Studio .NET 2003 and .NET Framework version 1.1
- The book covers major .NET topics from the top down, introducing simpler concepts first and progressing to greater technical detail.



Webcsearch Code 196777 **$59**

Microsoft Press

Webcode	Product	Price
196773	MS Press Visual C# .NET 2003 Step by Step	$79
196782	MS Press Excel 2002 Step by Step	$59
196769	MS Press Faster Smarter Beginning Programming	$39
196768	MS Press Faster Smarter Digital Photography	$39
196770	MS Press Faster Smarter Digital Video	$39
196771	MS Press Faster Smarter Home Networking	$39
196767	MS Press Faster Smarter HTML & XML	$39
196758	MS Press Faster Smarter Windows XP	$39
196781	MS Press FrontPage 2002 Step by Step	$59
196760	MS Press Introducing Windows Server 2003	$59
196795	MS Press MS Access 2002 Step by Step	$59
196775	MS Press MS IIS 6.0 Administrators Pocket Consult	$59
196786	MS Press Office XP Step by Step	$89
196797	MS Press Outlook Version 2002 Step by Step	$59
MSP085	MS Press Powerpoint 2002 Step By Step	$59
196764	MS Press Visual Basic .NET 2003 Step by Step	$79
196776	MS Press Visual C++ .NET 2003 Step by Step	$79
196788	MS Press Windows 2000 Server Resource Kit	$529
196779	MS Press Windows Security Resource Kit	$89
196757	MS Press Win Server '03 Admin's Pocket Consult	$59
196784	MS Press Windows XP Inside Out	$89
196774	MS Press Windows XP Plain & Simple	$39
196763	MS Press Windows XP Step by Step	$59
196785	MS Press Word 2002 Step by Step	$59

StarOffice 6

By Sun Microsystems

StarOffice 6.0 runs on Solaris, Linux and Windows.
Users can read, write and edit Microsoft Office files to maintain current investments and co-exist with other office suites.

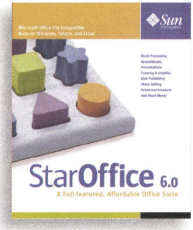
StarOffice Writer - A powerful word processing tool for creating professional papers, informative newsletters, and persuasive brochures. Easily integrate charts and images into documents. You can even publish Web content with Writer.

StarOffice Calc - This sophisticated spreadsheet application includes decision-making capabilities and data analysis functions. Charting tools let you create impressive, professionally rendered 2D and 3D charts.

StarOffice Impress - This high-end multimedia presentation program includes dazzling special effects, intriguing animations, clip art in every dimension (2D and 3D), and high-impact drawing tools. The great part: an AutoPilot wizard combined with hundreds of pre-designed templates makes the program practically run itself.

StarOffice Base - Manage relational data with ease using this integrated database program. Simple AutoPilots guide you through complex tasks. Slice data, dice it, and sort it any way you'd like. Base supports all major database standards: Oracle, ODBC, JDBC technology, and more.

StarOffice Draw - Infuse your documents with illustrated charts and graphs. This flexible drawing program enables you to create photorealistic 3D images, animated GIFs, and special font effects in a snap. Draw supports all major graphics formats.



Features:			
Heightened security	XML-based magic	Sleek new interface	
Online help	Improved interoperability		

Applications:			
Word Processing	Spreadsheets	Presentations	Relational Database
Drawing & Graphics	Web Publishing	Photo Editing	

Webcsearch Code 190179 **$179**

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Call 1300 658 600 or visit: www.csa.com.au
as prices may change due to the daily fluctuations and online discounts.
1300 658 600
VISA MasterCard



From $899* Per License

Microsoft Volume Licensing

Microsoft

Microsoft's Open Licensing program offers benefits when purchasing or acquiring multiple copies of Microsoft software. Designed for organisations with as few as two PCs and purchasing as few as five licenses on the initial order. Receive significant discounts over retail full packaged product prices - minimum 20% saving!

*Office XP Pro based on minimum 5 license purchase if you are a new MOLP customer.

Call our managed acounts team on 1300 761 761 to SAVE!



From $495* Per License

Adobe Transactional License Program

Adobe

The Adobe Transactional License Program (TLP) is a volume licensing solution that allows organisations to acquire Adobe software at a discount, based on the quantity of software licensed in a single transaction. Each Adobe product is assigned a point value (e.g. Acrobat = 1 point), and you receive a volume discount based on the point value of your transaction. Minimum 5 points to qualify!

City Software has recently become 1 of 5 Adobe Licensing Centres in Australia!

*Acrobat 6 Standard based on minimum 5 point purchase (Acrobat = 1 point) on Corporate TLP program. Acrobat 6 Standard from $235 per license on Government TLP program (Minimum 1 point purchase).

Call our managed acounts team on 1300 761 761 to SAVE!



From $545* Per License

Macromedia Volume License Program (MVLP)

macromedia

Whether you are a commercial, government, or education customer, the Macromedia Volume License Program (MVLP) offers flexible licensing solutions that help volume customers save time and money. Both software and subscription offerings are available though MVLP. Each product/offering is assigned a point value. 12 points are the minimum requirement for initial orders, 0 points for re-orders. For example, Studio MX is worth 4 points, Dreamweaver is worth 2 points, etc.

*Dreamweaver MX based on existing user, government department on Level D pricing. Dreamweaver MX from $665 per license based on new commercial customer purchasing with a minimum of 12 points.

Call our managed acounts team on 1300 761 761 to SAVE!



From $87* Per License

Symantec Security Licence Program

symantec. premier software partner

The Symantec Security Licence Program makes it easy to purchase Symantec enterprise security software solutions. The Symantec Value Program is a simple transactional plan that provides volume incentives for orders of as few as one server or 10 desktop licences, and rewards the purchase of multiple product types within a product family. As a certificate-based program, the Symantec Value Program is ideal for small to mid-sized companies. Customers simply purchase a media pack and the number of licences required from their reseller, and then receive the certificate from Symantec. Special pricing for academic institutions is also offered through the Value Program.

*AntiVirus Corporate Edition 8.1 (Workstation & Network Server) on minimum 10 license purchase (10-24 user pricing) on Symantec VLP.

Call our managed acounts team on 1300 761 761 to SAVE!



From $1338* Per License

Veritas VIP Volume Software License Program

VERITAS

A cost effective way to easily acquire and deploy licensed Veritas products. VIP offers the following key benefits: volume purchase incentives, immediate discounts, flexibility to suit your business needs, and a simple point system, tracked by Veritas. Enrolment in the open plan requires an initial order of only 10 points - so it is simple to qualify. The initial price depends on the number of accumulated points at the time of purchase. Future orders may increase the discount.

*Backup Exec 9 Windows Server Edition license based on entry level program (Plan A). Includes 24x7 mandatory support (VSupport).

Call our managed acounts team on 1300 761 761 to SAVE!



From $49* Per License

Computer Associates Open License Program (OLP)

Computer Associates

Computer Associates Open License Program (OLP) is designed to reduce the costs associated with acquiring, implementing and maintaining CA software. OLP clients simply meet a 40 point minimum purchase requirement on their initial order and can make additional OLP purchase for a 2 year period. OLP now includes a simplified program with a single discount level and a single license key for multiple installations.

*eTrust AntiVirus 7 on minimum 10 license purchase (10-99 user pricing) with 1 year maintenance. Includes Antivirus protection for the Desktop, Server, Gateway, Groupware, and Pocket PC 2002.

Call our managed acounts team on 1300 761 761 to SAVE!

Vet Anti-Virus Net Surfer

Complete virus protection from viruses on all drives, floppy disks, in email attachments and files downloaded from networks and from the Internet.



$85

Websearch Code VET006

CA ARCserve Backup 9 for Windows

Manage multiple backup jobs, devices and databases with one single view. Select multiple servers, clients and databases. Restore files from a single file to a whole volume. Choose between different media (CD, DVD, Tape, Optical, disk, etc) to backup/restore.



Full

$885

Websearch Code 193952

Upgrade 6.61 & 2000

$635

Websearch Code 193749

CA eTrust Antivirus 7

For Windows Workgroup Edition - 5 clients

CA's award-winning antivirus solution. Automated virus signature updates and centralized management ensure your network is protected against potentially damaging and costly virus incidents.



Full

$228

Websearch Code 195892

Upgrade

$145

Websearch Code 195893

Sonic Foundry VideoFactory

Based on Sonic Foundry's Vegas technology, VideoFactory is an entry level video editor. Capture and edit digital video on your PC. Perfect for home movies, web videos, music videos, weddings, corporate presentations and much more. Provides a straightforward, easy-to-use interface that will have you creating videos in minutes. Includes precise editing, titling, cool effects and transitions.



$209

Websearch Code 192078

Encyclopaedia Britannica 2003

Deluxe Edition CD-ROM

A world of knowledge at your fingertips Encyclopaedia Britannica 2003 Deluxe Edition CD-ROM brings the authoritative Encyclopaedia Britannica, Merriam-Webster's Collegiate Dictionary and Thesaurus, Atlas, Timelines, and more to your desktop. It's ideal for students, teachers, or anyone who wants fast, easy access to the most comprehensive information available. Includes photos, Merriam-Webster Dictionary, internet links, video and audio clips, a world atlas and more.

CD includes:

- Encyclopaedia Britannica UPDATED
- Merriam-Webster's Collegiate Dictionary and Thesaurus
- Atlas UPDATED
- Timelines
- Knowledge Navigator
- Rich Multimedia
- Research Organiser



CD

$88

Websearch Code 192078

MAUS Quality Assurance

Whether you looking to gain Accreditation & Certification under the ISO 9000:2000 standards or just to streamline the systems in your business, MAUS Quality Assurance is the ideal solution.

MAUS has created the ideal tool to take you step-by-step through creating a customised Quality Manual that meets the current ISO 9000:2000 standards. Utilising a unique Question and Answer approach, MAUS Quality Assurance explains exactly what the ISO standards are seeking to achieve. Also comes complete with sample forms and an on-going Document Control log.



Websearch Code 197072

$369

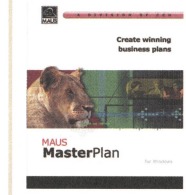
MAUS MasterPlan

Award Finalist in the Telstra Small Business Show Software awards

For people who need a winning, professional Business or Marketing Plan, MasterPlan's simple step-by- step question and answer format enables you to construct full financials, text and graphics in no time at all! Sample plans, real life examples and a unique financial wizard will ensure you prepare a perfect plan every time.

Suitable for:

- Simple and detailed Business and Marketing Plans
- Analysing and growing your business
- Starting a new business
- Forming new strategies and ideas
- Applying for finance
- Launching a new product or service
- Gaining a competitive advantage



Websearch Code 129545

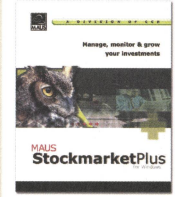
$179

MAUS Stockmarket Plus V5

Award Finalist in the Channel 9 small business show software awards

One of the biggest selling personal investment software tools in Australia. The application is a 4 in 1 Investment Software Tool. It handles shares, options, warrants, property, managed funds, fixed interest and a range of other investments with ease! Can now be used in conjunction with online bank accounts.

MAUS Stockmarket Plus provides investors with a comprehensive, yet user friendly tool which will allow you to not only keep track of your investments but provide you with enough vital data to make informed investment decisions.



Websearch Code... 161498

$179

MAUS Performance Review

- Save up to 90% of the time spent performing employee appraisals.
- Record day to day problems and accomplishments more efficiently.
- Includes Performance log; goals, critical incident reporting.
- Intelli-text technology to create eloquent text and to avoid incorrect wording.
- Expert Human Resource advice and coaching ideas are provided at each stage of the review, ensuring that your reviews will meet HR best practice. The software also includes an on-going performance log that gives you the power to record the week-to-week performance of your staff.



Websearch Code 189762

$229

MAUS Job Descriptions

Create clear, concise job descriptions in minutes. Choose from over 3,800 customisable job descriptions selectable by job title or industry. Use the question and answer format to address physical and educational requirements, work environment, qualifications and supervisory duties.

At the click of a button MAUS Job Descriptions will provide you with:

- An accurate concise library of cutomisable job descriptions
- Expert HR advice
- Custom interview questions and rating forms
- An 'Ad Writer' to help you write and place effective employment advertisements
- Protection from unfair dismissal claims



Websearch Code 191674

$239

MAUS Employee Manual

Create a handbook encompassing all of your organisations policies and procedures. The application covers issues such as holiday entitlements, employee benefits, employment contracts, recruitment, termination and much more through a simple to use question and answer format.

Whether your business is large or small, MAUS Employee Manual can help you achieve the kind of professional results you would expect from experienced consultants - but with a lot less time, effort and money.



Websearch Code... MAUS11

$179

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Call 1300 658 600 or visit: www.cax.com.au
ex prices may change due to the daily fluctuations and online discounts.

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ACT! Version 6

The #1 best-selling contact management solution — used by millions and praised by experts around the world.

With ACT! 6 you and your staff can:

- Get instant access to every detail of every relationship.
- Schedule unlimited calls, meetings and to-do items.
- Create and send personalised letters, faxes, and html e-mails.
- Manage your sales pipeline with forecasting tools and built-in reports.
- Share complete customer information in a workgroup environment.
- Integrates with handheld devices including Palm and Pocket PC* and popular accounting software such as QuickBooks*

** integration software sold seperately.*



Upgrade
Websearch Code 191975
$145

ACT Single User
Websearch Code 191976
$245

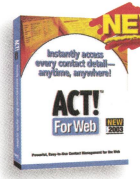
ACT 6 Pack
Websearch Code 191974
$1195

ACT! For Web

ACT! for Web introduces a fast, easy and powerful way to help your workgroup sell more, serve customers better and be more productive - whether you're all in the same office or have people around the country.

With ACT! for Web:

- Workgroups can perform the same functions as they do in ACT! however access, update, and share complete customer information in real-time using an Internet browser
- Remote ACT! for Web users can share realtime information with other users back in the office.
- Administrators can easily customise database screens without programming or HTML and assign specific security rights to individual users.



ACT For Web
Websearch Code 205441
$299

Dragon Naturally Speaking Standard 7

Talk to your computer and your words instantly appear in letters, emails, instant messages and chat rooms. Comes with a free headset microphone.



Academic
$139
Websearch Code 196438

Upgrade
$125
Websearch Code 196421

Full
$189
Websearch Code 196420

ACDSee Imaging 5

ACDSee digital camera software makes it easy to get, view, organise, print, enhance and share your digital photos super fast. Whether you are a digital photography beginner or a graphics professional, the picture viewer of choice for millions of people will make your digital photography experience more rewarding.

View and browse digital photos and graphics quickly, even large images or thousands of thumbnail previews at a time. ACDSee picture viewer and graphic converter is the solution for managing your images. You can even preview sound and video files for over 50 media formats in total, including AVI, MPEG and MP3. Plus, quickly store thumbnails of your entire CD collection and then browse through all your images without loading or switching discs.

- 5 User $565



Websearch Code 192553
$129

ACDSee Imaging 5 PowerPack

ACDSee PowerPack digital camera software kit combines ACDSee, the award-winning picture viewer used by millions of people, with ACD FotoCanvas touch-up photo editing software and ACD FotoAngelo slide show software.

ACDSee PowerPack digital camera software kit combines ACDSee, the award-winning picture viewer used by millions of people, with ACD FotoCanvas touch-up photo editing software and ACD FotoAngelo slide show software. Get, view, organize, print, enhance and share your digital photos super fast using ACDSee, fix and beautify them with ACD FotoCanvas and make multimedia slide shows you can share with anyone using ACD FotoAngelo.



Websearch Code 192953
$195

Dragon Naturally Speaking Preferred 7

Create documents, spreadsheets, and e-mail – all by speaking! Dictate and edit in virtually any Windows-based program. Includes free headset microphone.



Academic
$295
Websearch Code 196417

Upgrade
$219
Websearch Code 196419

Full
$379
Websearch Code 197400

PaintShop Pro 8

Not only have your favorite photo editing and graphic design tools been improved, there's a whole array of new ones. Plus, there's a brand-new integrated learning system that's easier to use than ever before. So whether you're new to Paint Shop Pro or have been using it forever, you can learn all the things you never knew how to do.

- Background Eraser. Quickly remove unwanted sections with the Background Eraser.
- Warping Tools. Create crazy caricatures with the Warp Brush by stretching, pulling, pushing, tugging, or swirling your image for all kinds of photo fun.
- New Filters and Effects. Smooth skin and produce romantic lighting effects, add realistic transparent bubbles, create seamless patterns, simulate the placement of a lens on your images, and much more.
- Perspective Correction Tool. With the new Perspective Correction tool you can easily fix perspective distortions.



Upgrade
Websearch Code 196525
$129

Full
Websearch Code 196309
$219

Paintshop Photo Album 4

Get your photos out of your camera and into your life with Jasc Paint Shop Photo Album. Now you can quickly and easily make the most of your digital photos. Get your photos from camera to computer in just two clicks. Then enhance, organise, and share those digital memories in a flash with Photo Album's fast and easy-to-use tools.



Websearch Code 196168
$89

Centennial Media Training for FileMaker Pro 6

The 6 x 2hr CDs in this set provide thorough and comprehensive training into all the features of this new version. Beginners can proceed training while more advanced users can access the CDs index for new features or problem solving.



PC/Mac
$462
Websearch Code 195830

Advanced Scripting
$297
Websearch Code 195831

Big Blue Pre-Paid Internet

Bigblue offers super fast, reliable internet access with no limits and no worries.



196220 1 Month $27.95
196222 6 Month $139.95
196223 12 Month $269.95

3 months
$74.95
Websearch Code 196221

Type Quick

Typequick's instant feedback, brilliant techniques and expert remediation guarantee that you will be typing with all fingers in just 10 hours. You will soon see why this likeable instructor has made more than 2,000,000 friends over the last decade.



$99
Websearch Code 190452

Get the most out of your Excel Spreadsheets

Instantly transform your Excel spreadsheets into rich, powerful solutions that enable you to perform searches, publish to the web, import and store images and sound, print reports, and more. If you purchase FileMaker Pro 6 (full, upgrade or educational version) between 1 July 2003 and 13 September 2003, you are eligible to receive a AUD$100 mail-in rebate. Conditions apply.

***Go to www.filemaker.com.au/promos for further details.**

Get $100 cash back* when you purchase FileMaker Pro 6



FileMaker Pro 6

FileMaker Pro 6 database software extends FileMaker's legendary ease of use with new, efficient ways to import digital images. It provides a virtually limitless capability for data exchange and application integration. Complete with enhanced productivity and formatting tools, as well as a host of instant productivity templates, FileMaker Pro 6 is the best solution for quickly creating and sharing information.

- More than 20 NEW, ready-to-use customisable templates and a Layout Report Assistant provide instant productivity for business, education and home
- Rapid, "hassle-free" multimedia and digital image importing to enhance your business solutions and bring your data to life
- XML Import and Export enables data inter-change with virtually anyone, whether or not they use FileMaker
- NEW Format Painter and other time-saving layout and word-processing tools for creating professional- looking forms
- Microsoft Office integration – automatically convert Microsoft Excel spreadsheets into functional, modifiable database solutions so you can sort, search, report, track, link and summarise your data with ease
- Instant Web Publishing allows easy collection and sharing of information via the Web

Winner of PC Magazine Editors Choice and winner of the Codie Award for Best Numeric/Database Software



Full
Websearch Code 190548
$559

Upgrade
Websearch Code 190549
$265

FileMaker Developer 6

FileMaker Developer 6 is the tool of choice for creating custom FileMaker solutions for deployment across workgroups, distribution as royalty-free runtime applications, or publication on the Web. Along with the benefits of FileMaker Pro 6, FileMaker Developer 6 includes updated time saving development tools. Test and verify your scripts' steps with the Script Debugger.

Document the schema of your FileMaker solutions with the Database Design Report. Use the Developer Tool to protect your solutions from modification and limit user controls, or to deploy your solutions in Kiosk mode or as a stand-alone application. Whether you are developing commercial or corporate solutions, FileMaker Developer 6 is the indispensable tool for creating, customising and deploying FileMaker solutions.



Websearch Code 192084
$1079

FileMaker Mobile 2.1

FileMaker Mobile 2.1 software lets you easily synchronise information between local FileMaker Pro 5.5 and 6 databases and Palm OS or Pocket PC handhelds. In just a few clicks, FileMaker Mobile 2.1 builds a streamlined database and loads the records and fields you select. Now with Symbol barcode reading device support. Leverage the powerful desktop database functionality of FileMaker Pro, for a comprehensive desktop-and-handheld database system that makes it easy to run your business, workgroup, or project and take the information you need with you wherever you go.

Now works with Pocket PC and Palm OS!



Palm for illustration purposes only.

Websearch Code 192416
$85

FileMaker Server (works with FileMaker Pro 6, 5.5 & 5 versions)

An easy-to-use relational database server is the best way to host your FileMaker Pro solutions on Windows 2000, Mac OS X, Mac OS and Red Hat Linux. This high-performance server engine supports up to 250 FileMaker Pro guests simultaneously on multiple platforms with several protocol options and up to 125-hosted files. It includes automatic plug-in updating, scheduled backups and remote administration tools to monitor server activity and to control guest and file connections.

While FileMaker Server is IT-friendly, it's also so easy to run that non-technical people will feel comfortable with its installation and day-to-day management. With automatic update of plug-ins, increased network performance, automated backups, auto disconnect of idle guests, and easy set up and administration, FileMaker Server is the best way to host your FileMaker Pro workgroup solutions.



Full
Websearch Code 130775
$2089

Upgrade
Websearch Code 190564
$1085

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Check out our Specials at www.cou.com.au or phone our change line for the daily fluctuations and online discounts.

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Borland C#Builder Professional

For the Microsoft.NET Framework

C# development with accelerated database power

A high-productivity C# development solution, the standards-based Borland C#Builder Professional for the Microsoft.NET Framework delivers native support for ADO.NET with the Borland DataProvider for faster, easier, and more flexible database development. C#Builder is designed to enable superior Web application development with support for ASP.NET, advanced debugging, and editor and modeling tools.

- Develop smart client applications with Windows Forms classes
- Develop high-performance Web solutions with C#Builder and ASP.NET

Upgrade Websearch Code 196959 **$945**

Full Websearch Code 196958 **$1879**



Borland Optimizeit Profiler 1.1

For Microsoft .NET Framework

Optimizeit Profiler for the Microsoft.NET Framework is built to enable the delivery of fast, reliable, scalable .NET applications. With comprehensive performance management capabilities such as CPU and memory usage analysis for .NET managed code, Optimizeit Profiler helps enterprise developers identify and remove performance hazards, speeding the resolution of performance issues and increasing developer productivity. Optimizeit Profiler gives .NET developers the tools to deliver high-performance applications with confidence, to track performance and reliability issues throughout the application development lifecycle, and to write stronger, faster code that leverages the power of the .NET platform.

- Tight integration with Borland C#Builder for the Microsoft.NET Framework and with Microsoft Visual Studio.NET

Full Websearch Code 196978 **$1315**



Borland JBuilder 9 Developer

The leading Java development solution

Speed your Java development with Borland JBuilder, the leading cross-platform Java development solution. JBuilder 9 Developer delivers technologies for rapidly creating and deploying Web and database applications. Maximize your productivity with a full-featured editor, advanced refactorings, build tools, team development support, database tools, Web application tools, JDK switching, unit testing, and debugging.

- Speed coding and increase productivity while retaining full control over your code
- Stay focused on development, not documentation Rapidly build and debug dynamic Web applications using Struts, servlets, JavaServer Pages, and XML

Upgrade Websearch Code 196928 **$1319**

Full Websearch Code 196954 **$1869**

Crystal Reports 9

High-productivity Report Creation and Integration

Crystal Reports is a high productivity reporting technology for rapidly transforming almost any data into powerful, interactive content. Tightly integrate dynamic content into .NET, Java and COM applications for end user viewing, interaction and modification at runtime. Let end users access and interact with key report objects via portals, wireless devices and Microsoft Office documents.

Crystal Reports 9 Advanced Edition

Designed for creating, integrating and deploying reports within complex enterprise web and wireless applications without increasing development overhead. The Advanced Edition is a high productivity reporting technology for tightly integrating reports into .NET, Java, and COM applications. It includes all the features of the Developer Edition plus additional web flexibility for custom data access, runtime report design and modification, and deployment.

Included with Advanced is Crystal Enterprise Standard.

A managed web reporting solution for fast and easy delivery of reports to end users via the Web. Any Crystal Report can be instantly published to the Web for end users to access, schedule and view"

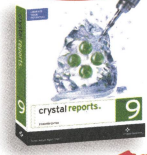
Crystal Reports 9 Developer Edition

Designed for creating and integrating reports into basic thick-client and web applications, the Developer Edition includes the report design and productivity tools of the Professional edition plus powerful application integration technology.

Crystal Reports 9 Professional Edition

Designed for high productivity report creation and small-scale distribution, the Professional Edition includes data connectivity and report design technology plus an introductory license for web-based report viewing by small teams.

"Special Offer: Crystal Enterprise 9 Standard included with Advanced edition"





Advanced Upgrade	Advanced	Professional Upgrade	Professional	Developer Upgrade	Developer
$2269	**$2749**	**$359**	**$689**	**$439**	**$819**
Websearch Code 192221	Websearch Code 195461	Websearch Code 191536	Websearch Code 191542	Websearch Code 191538	Websearch Code 191537

Ipswitch WhatsUp Gold

Larger organisations can use WhatsUp Gold at the departmental level to monitor the availability of applications, or to complement an existing monitoring system; small-to-medium sized businesses can use it as their all-in-one network management system.

With Maintenance Agreement $1715



$1339

Websearch Code 191853

Ipswitch WS_ FTP PRO

WS FTP Pro is the market leader in Windows-based FTP (file transfer protocol) client software. It enables users to move files between local and remote systems.

- Upload Wizard
- Auto Resume
- Custom Firewall Support with Editing Capability



$95

Websearch Code 196498

WebTrends Log Analyzer Series

Acquire, convert and retain more customers using web analytics with fast and easy-to-use web traffic reporting. WebTrends Log Analyzer Series is the most powerful and easy-to-use web site analysis solution specifically designed for the small business.



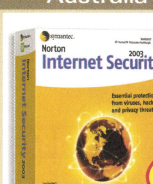
$945

Websearch Code WEB129

Symantec Volume Licencing

Buy in volume and SAVE $$$'s! The Value Program: Ideal for small to mid-size companies, Volume incentives for as few as one server or ten desktop licences, Rewards the purchase of multiple licences in a simple transactional plan, Simply purchase a media pack and the number of licences required from us and Symantec will send you the licence certificate. Take advantage of the huge savings!

Call our Managed Accounts team to SAVE! 1300 761 761



Norton Internet Security 2003

Symantec's Norton Internet Security 2003 provides essential protection from viruses, hackers, and privacy threats. Included are full versions of Norton AntiVirus and Norton Personal Firewall, which efficiently defend your PC from the most common Internet dangers. You also get Norton Spam Alert to block unwanted email, and Norton Parental Control to protect your children online.

- 24-hour protection provides vital Internet security for dial-up, DSL, and cable modern users.
- ENHANCED! Ad blocking now stops even more banner ads, pop-up windows, pop-under windows, and other Web distractions.
- LiveUpdate automatically downloads new security updates.

See the latest virus threats at www.csw.com.au/symantec.asp

Standard
Websearch Code ..... 191953 — $119

5 User Pack
Websearch Code ..... 192310 — $359

Norton Ghost 2003

Symantec's Norton Ghost 2003 protects your data from computer disasters. The intuitive Windows interface makes it easy to create regular backups of your hard drive. You don't even need to make a boot disk. File restoration is simple from the comprehensive disk image. Also available as a component of Norton SystemWorks Professional.



Standard
Websearch Code ..... 191942 — $129

5 User Pack
Websearch Code ..... 192311 — $385

Norton Personal Firewall 2003

Symantec's Norton Personal Firewall 2003 keeps hackers out and personal data in. Includes intrusion detection, application control and privacy protection in one easy program. It hides your PC from hackers, blocks suspicious incoming connections, stops malicious programs from spying on your system and prevents confidential information from being sent out without your knowledge.



Websearch Code ..... 191957 — $79

Norton AntiVirus 2003

Symantec's Norton AntiVirus 2003 is the world's most trusted antivirus solution. Now this easy-to-use program scans and cleans instant-message attachments as well as email messages. It removes viruses automatically, without interrupting your work. And automatic updates help defend your PC against new viruses. Protect your PC today with award-winning Norton AntiVirus.

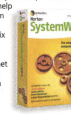


Standard
Websearch Code ..... 191986 — $88

5 User Pack
Websearch Code ..... 192309 — $259

Norton SystemWorks 2003

Symantec's Norton SystemWorks 2003 is the smartest way to solve computer problems. It includes award-winning Symantec products and additional utilities that help you protect your PC from virus threats, optimise performance, fix and prevent problems, recover from system failures, clean out Internet clutter and keep dial-up connections active when you are online.



Websearch Code ..... 191940 — $119

Symantec FireWall VPN Appliance

Model 100 - 4 Lan and 1 Wan Ports
Provides plug and play networking, web access, and firewall and VPN security for up to 25 users.
$679
Websearch 189887
RentSmart $7.44 p/wk

Model 200 - 8 Lan and 2 Wan Ports
Brings Firewall and VPN protection, load balancing, and high availability to offices with up to 40 users
$1399
Websearch 189888
RentSmart $15.34 p/wk

Model 200R - 8 Lan and 2 Wan Ports
Brings Firewall and VPN protection, load balancing, and high availability to offices with up to 40 users. Also includes the Symantec VPN Client (with integrated personal firewall).
$1729
Websearch 189889
RentSmart $18.95 p/wk



WinFax Pro

WinFax PRO 10 is the leading fax management software for small businesses. Its high-quality faxes help you project a professional image to your clients and customers. When image clarity is vital, you can generate photo-quality faxes. You can even send or forward faxes via email to people who don't have fax hardware or software.



Websearch Code ..... 189352 — $119

Norton SystemWorks Pro 2003

Symantec's Norton SystemWorks 2003 Professional Edition provides advanced problem-solving solutions to maximize PC performance. Includes award-winning Symantec products and valuable additional utilities to protect your PC from viruses, optimise performance, diagnose and fix problems and recover from disasters.



Websearch Code ..... 191941 — $159

pc Anywhere 11.0

NEW

Combines secure, industry-leading remote control with remote management and advanced file transfer to help IT personnel quickly resolve helpdesk and server support problems. Offers comprehensive security, including support for 13 authentication types.



pcAnywhere 11.0 host & remote
Websearch Code ..... 197446 — $263

pcAnywhere 11.0 5 user edition
Websearch Code ..... 197448 — $565

pcAnywhere 11.0 host edition
Websearch Code ..... 197447 — $165



Symantec AntiVirus Multi-User Packs

Symantec AntiVirus Small Business Edition 8.1 for Workstations and Network Servers

Symantec AntiVirus Small Business Edition 8.1 is a complete, license-in-a-box solution that protects workstations and network servers with the world's best-selling virus protection. With its unique NAVEX and Digital Immune System technologies, it provides fast, reliable, and hands-free virus detection, analysis, and repairs via an easy-to-use central management console

Symantec AntiVirus Small Business Edition 8.1 with Symantec AntiVirus/Filtering for Microsoft Exchange

Symantec AntiVirus Small Business Edition 8.1 with Microsoft Exchange is a complete, license-in-a-box solution that protects workstations, network servers, and Microsoft Exchange servers with the world's best-selling virus protection. With its unique NAVEX and Digital Immune System technologies, it provides fast, reliable, and hands-free virus detection, analysis, and repairs via an easy-to-use central management console

- SBS 5 User with Symantec Antivirus SBS 8.1 5 User
- SBS for MS Exchange 5 User with SAV SBS 8.1 with SAV/Filtering Exchange 5 User
- SBS 5 User with Symantec Antivirus SBS 8.1 10 User
- SBS for MS Exchange 5 User with SAV SBS 8.1 with SAV/Filtering Exchange 10 User

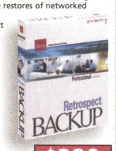
Call for pricing

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Dantz Retrospect Professional

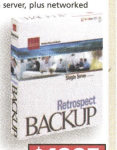
Dantz Retrospect Professional delivers the proven capabilities of our enterprise-class products to the home and home office user. You get thorough, fast backups and 100% accurate restores of networked desktops and notebook computers.
Designed for safety and security, Retrospect protects against loss due to viruses, newly installed software, user error, damaged hardware, hardware upgrades, hackers, and lost or stolen computers.



Websearch Code 197109 **$229**

Dantz Retrospect Single-Server

Designed for use in small to midsize businesses, Retrospect Single Server provides thorough, fast backups and 100%-accurate restores of a file server, or a line-of-business application server, plus networked desktop and notebook computers.
Retrospect protects against loss due to viruses, newly installed software, user error, damaged hardware, hardware upgrades, hackers, and lost or stolen computers for the utmost in safety and security. The industry leader in data protection for more than 12 years, Dantz has received numerous awards and protects millions of computers worldwide.



Websearch Code 197429 **$1225**

Dantz Retrospect Small Business Server

Designed for use in small and midsize businesses, as well as workgroups in large enterprises, Small Business Server delivers proven technology, complete protection, easy administration, and fast backups with 100% accurate restores. It runs only on MS Windows Small Business Server and backs up and restores the server as well as networked desktop and notebook computers. It includes the Exchange Server Agent, the SQL Server Agent, and the capability to create a Disaster Recovery CD.



Websearch Code 197430 **$1285**

Dantz Retrospect Multi Server

Designed for use in small to midsize businesses, Retrospect Multi Server provides thorough, fast backups and 100%-accurate restores of networked file servers, line-of-business application servers, desktops, and notebook computers. Retrospect protects against loss due to viruses, newly installed software, user error, damaged hardware, hardware upgrades, hackers, and lost or stolen computers for the utmost in safety and security.



Websearch Code 195992 **$1945**

Disaster Recovery Add-on

Dantz Retrospect can create disaster recovery CDs for the backup server. While other vendors require that the Disaster Recovery CD be created when the computer is alive, Dantz Retrospect can create a Disaster Recovery CD for a computer that is already dead. The Disaster Recovery process installs the operating system, restores system settings, and finally restores the computer's entire hard drive to any point-in-time.



Websearch Code 195995 **$1065**

Open File BackUp Add-on

Open File Backup allows files to be backed up while they are opened and being used. This is important to ensure proper backup of server applications which are up and running 24 hours a day such as Exchange Server and SQL Server, customer relationship management applications, and accounting packages. For desktop and notebook computers, files containing email messages or calendar appointments can be backed up while they are being used.



Websearch Code 195993 **$1285**

Proactive Client BackUp Add-on

Proactive Client Backup ensures that no computers get starved from being backed up, even if the time required to do the backups exceeds the time allotted to do the backups. This is especially important when backing up networked desktops and notebooks. Proactive Client Backup keeps track of which machines it has backed up, so it can resume backups efficiently during the next scheduled backup session.



Websearch Code 195994 **$1060**

Exchange Server Agent

Retrospect Exchange Agent provides incremental backups of Exchange 5.5 and Exchange 2000 servers while they are running. The Exchange Agent can be configured to perform a full copy on a particular day of the week or every day.



Websearch Code 195996 **$1245**

Retrospect Top 10 Backup Tips...

1. Develop a backup plan - determine how often, a drive to backup to, and backup software you can rely on.
2. Back up often - back up frequently.
3. Automate your backups - schedule your backups when it's most convenient - at night, on weekends or when your computer is least active.
4. Back up more than just documents - restore your entire hard drive in just minutes.
5. Perform incremental backups - back up only new or changed files to your original backup so you can restore your hard drive exactly.
6. Make several copies - to increase the degree of data protection, make numerous sets of data and keep on set in a secure offsite location.
7. Verify your backup - make sure you have full read-back verification.
8. Take advantage of compression - save time and money by squeezing up to twice as many files onto your backup media.
9. Use Retrospect software - the best backup software for any storage device - desktops, notebooks, workgroups and servers.
10. Don't procrastinate - develop your backup plan now!

Remember, the purpose of backup software is to restore. If you can't get back what you've lost, the time and money you've spent backing up was wasted!

Laplink GOLD 11

Access your PC and transfer your files from virtually anywhere. Gives you the ease of quick access to a desktop PC to tap into all of your network resources. Access files, synchronize data between PCs, run database applications, operate, maintain and even reboot PCs or servers.

- **Upgrades Available**



Full
$349
Websearch Code 197062

WinZip 8

The archive utility for Windows and the ultimate companion for Internet downloading. Zipping safely compresses the data in your files, so that your files then occupy less space, allowing you send and save more! Multi-user licenses available. Picture used for illustration purposes only.



$89
Websearch Code 190595

Red Hat Linux 9 Personal

Offers everything needed for a personal productivity workstation, from installation through system maintenance.



$59
Websearch Code 196807

PowerQuest

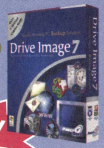
Drive Image 7

Drive Image is a Complete Solution for Disaster Recovery, Backups & System Upgrades

$77 Full 197299

$62 Academic 197300

NEW Version 7!



Every computer is vulnerable to data loss caused by viruses, faulty software or hard disk failure. PowerQuest's Drive Image provides a complete backup solution, saving you hours of frustration when inevitable failures happen. With your operating system, programs and settings as part of one backup file, you can have your computer up and running again in a *matter of minutes!*



New easy-to-use, intuitive Windows interface.

New Drive Image features include:

- Use hot imaging to create backups without *EVER* leaving Windows
- Save your backup to virtually any internal or external drive (CD or DVD burners, USB or FireWire devices, network locations)
- Mount your backup as a driver letter for easy access
- Make backup simple with a user-friendly Windows interface and step-by-step wizards

PowerQuest

PartitionMagic 8

The Standard in Hard-drive Partitioning

$77 Full 191926

$95 Academic 192339



Partitioning allows you to manage your hard drive more efficiently. Your computer views each partition as a separate hard drive, automatically giving it a drive letter, allowing you to conveniently organise your hard drive and maximise the performance of your system. Dividing your hard drive into separate partitions plays an essential role in maintaining your computer preventing conflicts, protecting data, improving efficiency and increasing performance.



Easy-to-use wizards help you safely install and run multiple OSes.

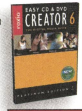
New PartitionMagic 8.0 features include:

- **FREE** PowerQuest DataKeeper - effortless data protection software
- New step-by-step wizards - create backup partition and install another OS
- File Browser - browse, copy, or move files and folders from one partition to another regardless of partition type (e.g. Windows [FAT/32, NTFS] and Linux [Ext2, Ext3])
- PQBoot for Windows select which OS to run on your next reboot while running in Windows

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RENTSMART

Roxio Easy CD & DVD Creator 6

Rip, play, edit, organise and burn your digital music with new AudioCentral. Preserve memories in electronic albums, create photo slide shows, print or e-mail photos with new PhotoSuite. Make DVD movies with professional transitions and animated menus to play on your home DVD player with new DVD Builder.



Websearch Code 194992

$122

Roxio Photosuite 5 Platinum

PhotoSuite 5 Platinum makes photo editing simple and fun with automated tasks, professional-level editing tools, creative projects and Easy CD Creator burning technology all integrated into one program. Step-by-step instructions allow you to immediately begin importing, organising, archiving, editing and sharing photos with family and friends on CD or Video CD.



Websearch Code 196890

$109

Roxio VideoWave

Create your DVD movie in minutes with Roxio VideoWave Movie Creator! Automatically transform your video and favorite song into a compelling movie with introductions, transitions, titles and effects. And if you want more control, our easy editing tools empower you to quickly achieve impressive results. Burn your movie to CD or DVD and share with family and friends!



Websearch Code 196891

$109

Trellian SubmitWolf

Register your pages with over 1000 search engines and Directories in minutes. Post your links to over 500,000 link pages. Submit as many of your URLs as you like at no additional cost. 48 Hour, Priority Paid Submission on MSN, AOL, HotBot, GOTO, iWon, AltaVista, Slider.com and other sites part of the Inktomi network.



$125

Websearch Code 130006

Pinnacle Instant CD/DVD

With drag and drop simplicity, Pinnacle Systems InstantCD/DVD software accomplishes all the tasks associated with a disc burning project. It encodes MP3 files, burns audio CDs, duplicates CDs and DVDs, backs up data, and even creates photo and video slideshows that can be viewed on practically any home DVD player.



Websearch Code 195801

$144

Steinberg Clean 4

Restoration & CD burning software Music without crackle or hiss LPs, MCs, CDs & MP3s onto CD in sonic perfection. High-quality real-time effects & surround sound. Wizard for restoration & optimisation of your sound IntelliAssistant - for fully automatic handling TubeSimulation - Hifi valve amplifier simulation WaveLab Lite 2.5: ultra-quick music editing, real-time crossfades and mastering effects



Websearch Code 197357

$95

Steinberg Clean Plus 4

Restoration & CD burning software plus USB phono preamp Music without crackle or hiss LPs, MCs, CDs & MP3s onto CD in sonic perfection. High-quality real-time effects & surround sound. Wizard for restoration and optimisation of your sound. Includes top-quality USB phono preamp plus connection cables All the features of clean plus the high quality preamp!!!



Websearch Code 197356

$225

Trellian Jack the MP3 Ripper

An efficient ripping tool that enables the user to extract audio from a CD and export the music into either *.mp3 or *.wav format.

- Encodes to MP3 or WAV
- Encoding to MP3 format is done at various bit rates
- Full editing and saving of MP3 format Title/Artist/Trackname IDTAG information
- Requesting of Title/Artist/Trackname data over the Internet



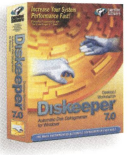
$59

Websearch Code 190113

EXECUTIVE SOFTWARE Diskeeper 7.0

Optimum Disk Performance.

- The first, fastest and most technically advanced defragmenter with unique features to improve the performance of Windows XP, Windows 2000, Windows NT, Windows 95, Windows 98 and Windows Me as a single network wide solution to disk fragmentation.
- Optimises the disk drive performance by restructuring the disk drives file systems to minimise file and free space fragmentation thereby optimising the performance of the systems accessing of existing files and creating new files.
- Runs without operator intervention ensuring optimal performance of the systems disks at all times.
- Uses processor idle time so as to not interfere with normal disk performance
- Safe with all types of disks, including large capacity disks, RAID arrays and all databases and servers sharing disk Clusters.



Server
Websearch Code 190526

$575

Workstation
Websearch Code 190253

$125

Nero 5.5

New built-in ultrafast Wave Editor makes Nero your all-in-one editing burning solution! Gives you complete control over your audio files before you record them to disc and much more!



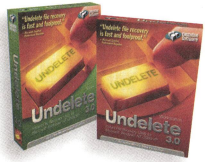
$165

Websearch Code NERO01

EXECUTIVE SOFTWARE Undelete 3.0

Instant File Recovery.

- Undelete is the first and only complete file recovery system designed from the ground up for Windows 2003/2000/XP/NT networks providing enhanced protection for local files and more importantly, protection for remote files on a server or workstation, something Windows does not provide.
- Saves Time by freeing network administrators from the time consuming task of restoring files from tape and for users to have their deleted files restored immediately.
- Important business files, even those created since the last backup, are not lost.
- Can undelete across the network which no other product is capable of achieving.
- Includes many other features!



Server
Websearch Code 195580

$610

Workstation
Websearch Code 189956

$125

IMSI Org Plus 4

With automatic chart drawing, custom formatting, compact layouts and easy editing, OrgPlus beats any other drag-and-drop application, hands down. What's more, OrgPlus 4.0 provides the functions of a back-end database with up-front simplicity as well as multiple ways to communicate your charts with impact.



$325
Websearch Code 189873

IMSI TurboCAD 8 Standard

Complete, integrated 2D/3D CAD software. Create, edit or view CAD drawings. Comprehensive 2D power is seamlessly integrated with superior 3D surface modeling as over 250 tools are grouped logically for quick and easy access.



Standard
$179
Websearch Code 196074

Professional
$1039
Websearch Code 195938

IMSI Legacy Family Tree Premium

An entire suite of tools for creating your family tree for generations to come. Manage digital photos, scanned documents and more to quickly incorporate into your family tree; Photo Restoration Discounts



$79
Websearch Code 195245

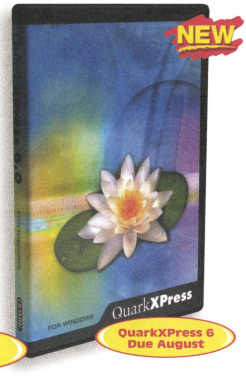
QuarkXPress 6

If you publish, you know the power of QuarkXPress.

Much more than a page layout tool, QuarkXPress 6 provides proven performance with graphics and colour management, text processing, Web-page design, XML, output and more!

- Supports Mac OS X (Requires Mac OS X v10.2 (Jaguar) or later), Windows 2000, and Windows XP. You also have the ability to add functionality through XTensions software.
- Whether for print or Web, QuarkXPress 6 has the features you need to re-use your content without having to re-create it every time. Take advantage of enhanced XML features to automatically export or import information to and from a layout.
- Share information among layouts for dynamic efficiency - share style sheets, colours, hyphenation settings, lists and even text.
- Synchronise text for speed and accuracy - save time and reduce the number of data entry errors by creating text for print and Web pages at the same time and editing that text in one place.
- Create PDF files directly from QuarkXPress without having to buy third-party software.
- QuarkXPress 6 offers improvements to output features for print-optimised layouts. Although many of these powerful features may not be evident at first glance, their incorporation into QuarkXPress 6 underscores Quark's continued commitment to supporting open standards in the workflow and delivering the highest quality output.

QuarkXPress 6 is the best choice for page layout software because it's easy to use, it helps produce exceptional design and it provides unrivaled outputting capabilities.



Run Out Deal on QuarkXPress 5

QuarkXPress 6 Due August

Quark XPress 5.0
Websearch WIN 189842
Websearch MAC 189843
$3245

Call for Pricing. v6 Pricing Set to Rise!

Extensis Suitcase 10

The ultimate font manager!

Extensis Suitcase 10, the world's best selling font manager, takes the work out of working with fonts. Packed with automated features that make activating, organising and previewing fonts a snap, Suitcase is the fastest way to work with fonts in today's creative applications. Now, Suitcase 10 provides true font management for Mac OS X, supporting both OS X and Classic applications.



- Suitcase 9.2 Win $99
- Suitcase 10 Server MacWin $1949
  Includes 5 MacWin clients FREE

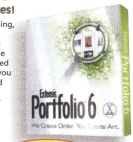
Mac OS X Compatible

Full
Websearch Mac EXT108
$199

Extensis Portfolio 6

Organise your digital images!

Portfolio is the perfect tool for tracking, organising and distributing digital photos and other image files. Unlike digital photo managers such as Apple iPhoto, Portfolio gives you unbounded freedom to store images anywhere you want, with no limit on keywords and a high-powered search engine that provides instant visual access to your files from anywhere on your system.



- Portfolio 6 Server MacWin $5899
  Includes 5 MacWin clients FREE

Mac OS X Compatible

Full
Websearch WIN 207083
Websearch Mac 189580
$425

Extensis MaskPro 3 & Intellihance Pro 4 Bundle

SAVE $301 off RRP

Using advanced color matching and decontamination technology, Extensis Mask Pro 3 allows you to create flawless, real-life masks from the most difficult images. An improved feature set offers better control over edge transparency and background color spill. Mask Pro 3 also boasts the most robust and intuitive toolset on the market.



Using Intellihance Pro 4 quickly and dynamically enhance images to make them look their best based on the image's individual needs. Compare and print up to 25 professional enhancement variations at once.

Mac OS X Compatible

Bundle
Websearch Code 196320
$419

Extensis PhotoFrame 2.5 & Intellihance Pro 4 Bundle

SAVE $301 off RRP

With Extensis PhotoFrame, there's no limit to the dramatic border effects you can design! Two new volumes of professionally designed frames, including emulsion, acid burn and meltdown, allow you to create truly unique designs. Customise and combine any of the stunning 2000+ edge effects or add your own touches with textures, shadows and more.



Using Intellihance Pro 4, quickly and dynamically enhance images to make them look their best based on the image's individual needs. Compare and print up to 25 professional enhancement variations at once.

Mac OS X Compatible

Bundle
Websearch Code 196321
$419

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fluctuations and online discounts.

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Adaptec MyDVD Media Suite

Create your own DVDs, Video CDs, Data ROMs and Music CDs in minutes! Built on the same technology used by Hollywood's top DVD production studios, MyDVD Media Suite makes it fast and easy to convert videos and photos into great-looking DVDs and Video CDs. Plus, with MyDVD it's a snap to backup your data and create music CDs.

- Burn it all - music/video/photos/data.
- Capture, edit and share videos on DVD or CD.
- Create photo slideshows and photo archives on DVD or CD.
- Burn MP3s and audio files to CD.
- Backup data on DVD or CD.

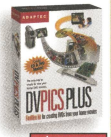


Websearch Code 206993 **$115**

Adaptec DV PICS Plus

With the quick installation of our FireConnect 4300 adapter card and the accompanying easy-to-use editing and DVD creation software, you'll have your own homemade DVD in a snap. With DVpics Plus, you can add titles, graphics, music, and even special effects. Capture any occasion for family and friends in a short movie that can be shared through videotape, CD, DVD or via the World Wide Web. Just imagine the important events that you can now preserve and share on DVD with ease.

- Firewire kit for creating DVDs from your home movies.
- Capture video clips from your DV camcorder to your PC with Adaptec FireConnect
- Edit them with special effects using digital video editing software
- Organize them into easy-to-navigate menus with Sonic MyDVD 3
- Burn the finished project onto CD-R or DVD-R media.



Websearch Code 197594 **$145**

Adaptec VideOh! PCI Video Converter Kit

Provides the easy way to convert analog camcorder video digitally then burn to DVD or CD discs with your PC. Includes a PCI MPEG-2 capture card with A/V cable for simple connectivity to camcorders or other analog video device. Also includes Sonic MyDVD DVD-Video creation software for Windows, which allows you to edit, author and burn video clips.

- Convert analog tapes to DVD.
- Capture in real-time with MPEG-2 hardware.
- Enhance your video with sound, titles and special effects.
- Burn and watch on your PC or DVD player.



Websearch Code 197006 **$272**

Sonic Foundry Sound Forge 6

Sound Forge allows you to edit, record, encode, and master nearly any form of digital audio including WAV, AIFF, MP3, and more. Includes editing features, effects and processing, CD features, encoding features and video features.

Includes a powerful set of audio processes, tools and effects for recording and manipulating audio. This industry-standard application is perfect for audio editing, audio recording, effects processing and rich media encoding. Edit files nondestructively down to the sample level with extreme speed and accuracy. Choose from over 35 real-time audio effects and processes with more than 200 presets.

- **Academic $479**



Websearch Code 190397 **$562**

Sonic Foundry Vegas 4

Vegas 4 - A complete solution for digital video production, audio recording, editing and mixing, streaming content creation, and surround-sound production. With an unparalleled feature set and proven ease-of-use, Vegas 4 sets a new standard for professional multimedia production.

Sonic Foundry Vegas 4 + DVD - In addition to Vegas 4, this integrated production studio includes a Dolby-certified AC-3 encoder and DVD Architect, a professional DVD authoring solution. DVD Architect is an extensive set of professional tools for developing dynamic menu-based DVDs, music compilations, movies, and slideshow presentations. DVD Architect even lets you import Dolby Digital AC-3 files to create powerful surround-sound DVDs.



Vegas
Websearch Code 195410 **$769**

Vegas + DVD
Websearch Code 206917 **$1245**

LightWave 3D

Off the shelf, LightWave 3D is the most complete solution for 3D graphics and animation, boasting the industry's fastest most beautiful rendering engine, complete subdivision modeling, and an animation system built upon the world's fastest, most accurate 3D Inverse Kinematics (IK) engine.

Featuring: 3D Animation, Broadcast Graphics, Game Development, Live Production, OEM, Print Graphics, Video Editing, Visual FX, Visualisation and Web Streaming.

Proven for years in television, film and games, LightWave 3D is also being used to create graphics for print, web, industrial design, architecture, medical imaging and anywhere else a 3D package is needed. Soft-body dynamics, particles, hair and fur, plus unlimited render nodes, to name a few; LightWave 3D ships with all the tools an artist needs to create.

- **Academic $829**



Websearch Code 206918 **$2997**

Alien Skin Eye Candy/Splat! Bundle

Eye Candy includes a collection of 23 filters combining practical effects like shadows, bevels and Smoke and more. Splat! is a powerful filter set for Photoshop combining frames, textures, edges, borders, mosaics and more.



$499
Websearch Code 206916

MS Virtual PC 6.1

Virtual PC for Mac lets you run Windows software on your Mac, giving you access to the wide array of software written for Windows, easy file sharing, and compatibility with Windows networks. Switch back and forth between Mac OSX and Windows applications as easily as you switch between windows. Share files easily between Macs and PCs. Virtual PC is built for Mac users by Mac users.



Available August

$299

Sonic Foundry Acid Music 3

The perfect solution for creating original, royalty-free music quickly and easily. Create music in any style imaginable with its multi-genre loop library containing over 600 loops. "Paint" your music without messing with complicated sequencers, drum machines or musical instruments. After you're finished with your tune, burn it to CD with ACID Music's Track-at-Once CD burning, export to MP3, or publish online.



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Websearch Code 206905

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Corel Ventura 10

Corel Ventura 10 is your professional publishing solution. It's the only tool you need for transforming long, complex documents including XML files into highly formatted and visually rich publications.



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Websearch Code 191558

Full
$1349
Websearch Code 191557

Corel Designer 10

Delivering precision tools that improve efficiency, built specifically to streamline the production of technical design. Create, manage, plot, share and reuse technical diagrams.



Upgrade
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Websearch Code 194994

Full
$899
Websearch Code 194993

CorelDRAW Graphics Suite 11

- CorelDRAW 11- Intuitive graphic design for print and the Web
- Corel PHOTO-PAINT 11 Fast, easy and powerful photo editing
- Corel R.A.V.E. 2 - Web graphics and animation



Academic
$125
Websearch Code 190614

CorelDRAW 11

With more than 15 years of continual enhancements, CorelDRAW 11 delivers graphic design and vector animation software for print and the Web and now for a limited time you can own it for only $299*. If you own previous versions of CorelDRAW or any other vendor's graphics application (such as Adobe Illustrator) you can upgrade or cross grade to the latest version of CorelDRAW 11 for only $299*

Great features of CorelDRAW 11 include:

- New Symbols support – reduce and reuse the most important elements in your designs
- New Roughen and Smudge brushes – easily edit curves with these pressure-sensitive tools that feature full tablet support
- New 3 Point Ellipse, Rectangle and Curve tools – create exact size and rotation of theseshapes in two easy clicks
- Live Effects – work freely and efficiently with real-time feedback
- Enhanced SVG support – create data-driven, dynamic graphics using SVG
- Customisable workspace – design a workspace that suits your personal needs
- New Polyline tool – create curves and lines in one stroke, using one tool



LIMITED TIME OFFER
MASSIVE PRICE REDUCTION

* Users can upgrade from any version of Microsoft Windows (and Mac OS for Painter Only). Further details can be obtained from Corel Customer Service on 1800 658 850. Terms and Conditions apply.

Upgrade/Crossgrade
Websearch Code 194693
$299

Corel Painter 8

The new Corel Painter 8 unleashes your creative power, increases your productivity and enhances your compatibility with Adobe Photoshop while giving you the Natural Media tools you need to create artwork for print or the Web.

Get even more out of Adobe Photoshop or CorelDRAW (or any graphics software package) with this great offer on the latest version of Painter. To take advantage of this offer all you need to do is upgrade from any version of CorelDRAW or cross grade from any graphics software application to the latest version of Painter 8 for only $315*

New Features:

- Allows you to blend unique paint colours using the Mixer
- Allows you to interactively design custom brushes with the Brush Creator
- Replicate the traditional painting experience with Digital Watercolour
- Create sketches from photographs, and experiment with over 400 new brushes.
- Work more productively with a redesigned interface and customisable palettes and industry-standard layer masks and channels.



LIMITED TIME OFFER
MASSIVE PRICE REDUCTION

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Upgrade/Crossgrade
Websearch Code 196513
$315

Corel WordPerfect Office 11

WordPerfect Office 11 includes:

WordPerfect 11 - word processor Quattro Pro 11 - spreadsheet
Corel Presentations 11 - slide show creator CorelCENTRAL Address Book

GREAT NEW FEATURES INCLUDE:

- Enhanced Compatibility with MS Office (supporting older file versions of MS products than they do!)
- XML Integration: New Publish to XML in WordPerfect, Quattro Pro and Presentations, New import XML in Quattro Pro, Enhanced XML Editor in WordPerfect
- Enhanced Publish to PDF from WordPerfect and Presentations
- New WordPerfect Classic Mode: WP 5.1 Blue Screen and Keyboard
- New Document Map
- New Collaborative Review
- New Outlook Address book integration
- Enhanced CrossTab Reports



LIMITED TIME OFFER
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Upgrade/Crossgrade
Websearch Code 196505
$285

iGrafx FlowCharter 2003

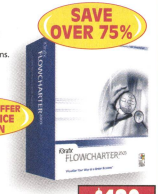
You will be able to enjoy improved productivity and ease-of-use when creating flowcharts, process maps, and other business diagrams with iGrafx FlowCharter 2003, the newest version of the award winning ABC FlowCharter. Document even the most complex processes, systems, or organization charts in record time using the intuitive drawing features of iGrafx FlowCharter 2003, then output to Web, print or presentations.

Publish Web Project - Publish a directory of iGrafx and supporting documentation to the Web with a single command.

- Publish to Microsoft Office and WordPerfect applications
- Import Process Data
- Improved Size and Align Commands.

Cause and Effect Diagram - The new Cause & Effect diagram type initializes the workspace with a default fishbone diagram, statistical worksheet and Pareto chart.

- Designed for Microsoft Windows XP



LIMITED TIME OFFER
MASSIVE PRICE REDUCTION

* Users can upgrade from any version of Microsoft Windows (and Mac OS for Painter Only). Further details can be obtained from Corel Customer Service on 1800 658 850. Terms and Conditions apply.

Upgrade/Crossgrade
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$189

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Streamline business document exchange and review. Enables business professionals to easily convert any electronic or paper document - even a Web site - to a reliable Adobe Portable Document Format (PDF) file for exchange and review with colleagues and customers.

Create and exchange electronic documents
Easy Adobe PDF creation, document merge, scanning to Adobe PDF.

Streamline document reviews
Review management, accurate comments, comment summaries.

Protect sensitive documents
Password protection, 128-bit encryption, digital signature support.

- **Upgrade $199**
- **Academic $165**



Full
Websearch WIN..... 196180
Websearch MAC..... 196173
$565

Adobe Acrobat 6.0 Professional

Advanced control over document exchange and output. Enables business, creative, and engineering professionals who work with graphically complex documents to improve the reliability and efficiency of business-critical document exchange. Acrobat Professional offers all the benefits and features of Acrobat Standard and more.

Benefits for business professionals
Create and combine documents for review, streamline review management, use robust commenting tools, efficiently integrate comments, create forms, create secure, searchable archives

Benefits for engineering professionals
Create rich, layered documents, benefit from enhanced file viewing and navigation, comment using specialized tools

Benefits for creative professionals
Preflight and preview content, create rich-media Adobe PDF files, create forms, produce high-quality output

- **Upgrade $299**
- **Academic $249**



Full
Websearch WIN..... 196182
Websearch MAC..... 196181
$849

Centennial Media Acrobat 5

Alan Rosenfeld, Applications Specialist from Adobe Systems Aust. provides easy to follow and comprehensive instruction for students or business users alike. The range of this versatile software is systematically unfolded and demonstrated in four hours of expert tuition.



$198
Websearch Code..... 195833

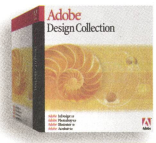
Centennial Media Photoshop 7

The graphics industry worldwide relies on the power of Photoshop. Students will be well prepared for future employment if they have a sound understanding of this software. In 8 hours of in-depth training Mike McHugh covers this essential program.



Photoshop 7
$363
Websearch Code..... 195835

Photoshop Elements 2
$198
Websearch Code..... 195832



Adobe Design Collection

The Adobe Design Collection contains four leading-edge design and publishing applications in one fully integrated suite. Together these programs give you everything you need to create and produce professional documents across media.

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- Adobe Photoshop 7.0
- Adobe Illustrator 10
- Adobe Acrobat 6.0 Standard

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Savings based on individual product prices

Academic
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Websearch MAC..... 197310
$669

Websearch WIN..... 197313
Websearch MAC..... 197312
$2249

Adobe Collections

With four professional Adobe design tools for one affordable price,creative freedom, productivity, and value are just some of the benefits.

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$1989

Adobe Web Collection - Includes GoLive 6.0, Photoshop7.0, Illustrator 10, Acrobat 6.0
$1989

Adobe Digital Video Collection - Includes Premiere 6.5, Photoshop7.0, Illustrator 10, After Effects 5.5
$2399

Huge Savings with the Adobe Collections
Savings based on individual product prices

Adobe Photoshop Album

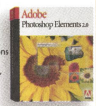
Finding and organizing your digital photos is a snap with Adobe Photoshop Album. Now you can see all of your photos in one place and instantly sort them by date or by any keyword you choose. Easily fix basic flaws and share your photos in slide shows, albums, cards, calendars, and more. Adobe Photoshop Album has everything you need to find your photos and quickly share your memories.



Websearch Code..... 194926
$95

Adobe Photoshop Elements 2.0

The perfect combination of power and simplicity so you can do more with your photos. From quickly correcting red eye, color, and exposure to more creative editing, you can easily achieve outstanding results. Comprehensive Help features offer easy-to-understand explanations, definitions of terminology, hints for using editing tools, and more.



Full
Websearch Code..... 191428
$159

Centennial Media InDesign 2

Mike McHugh, a presenter for Adobe Systems, covers InDesign 2 in 6 hours in a comprehensive and easy to follow manner.
Ideal for classroom training and lesson content.

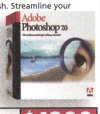


$297
Websearch Code..... 195834

Adobe Photoshop 7.0

Explore new creative options, and produce the highest quality images for print, the Web, wireless devices, and anywhere else. With the new File Browser, you can inspect image data without opening files. Effortlessly remove dust, scratches, and other flaws with the new Healing Brush. Streamline your Web design using new transparency capabilities and sophisticated rollover controls.

- **Upgrade $349**
- **Academic $499**



Full
Websearch WIN..... 195988
Websearch MAC..... 195987
$1299

Adobe Illustrator 10

Adobe Illustrator 10 defines the future of vector graphics with groundbreaking creative options and powerful tools for efficiently publishing artwork on the Web, in print, everywhere. Produce superb Web graphics using symbols and innovative slicing options. Explore creative ideas with live distortion tools. Publish graphics in record time with dynamic data-driven graphics and other productivity features.

- **Upgrade $349**
- **Academic $165**

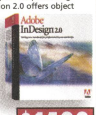


Websearch WIN..... AD0309
Websearch MAC..... AD0308
$849

Adobe InDesign 2.0

InDesign 2.0 integrates tightly with Adobe Photoshop, Adobe Illustrator, and Adobe Acrobat. When you're ready to print, the results are precise and reliable. InDesign 2.0 also makes it easy to move beyond print with built-in support for publishing pages anywhere. Version 2.0 offers object transparency, long-document management options, one-step table creation, XML import and export, improved performance, and more.

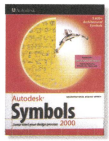
- **Upgrade $349**
- **Academic $349**



Websearch WIN..... 195989
Websearch MAC..... 195987
$1499

Symbols 2000 Architectural

A professional collection of more than 5,600 architectural symbols that let you complete detailed floor plans and construction documents dramatically faster. The package includes symbols for external layouts (bushes, trees, people), plan views, elevations and sections, electrical installation, building services/HVAC (plumbing, ventilation), kitchens, bathrooms, office furniture, network planning, pictograms for recreation, sports organi-sation and planning.



$198
Websearch Code.....130191

Symbols 2000 Engineering

A collection of more than 10,000 symbols in total, covering symbols for manufacturing and schematics drawings. The set includes more than 3,100 symbols for electrical schematics and installation plans complying with IEC standards with symbols for switching equipment, generation and conversion of energy, telecommunications and electrical installation.

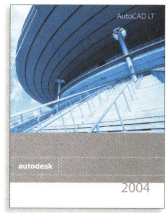


$198
Websearch Code.....130331

AutoCAD LT 2004

Efficient, Secure, Affordable 2D CAD Software

AutoCAD LT® 2004 is the affordable 2D CAD software that helps you create and share drawings more efficiently and securely. AutoCAD LT streamlines the drafting process with an optimized DWG file format, a more intuitive interface, and new and enhanced productivity-boosting design tools. It makes sharing design data more secure with the ability to apply digital signatures to your DWG files or deliver files in the view-and-plot-only DWF™ (Design Web Format™) file format. Plus it provides full DWG compatibility with AutoCAD® 2004 and AutoCAD 2004-based, industry-specific software.



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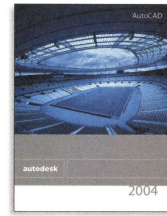
Full Version
Websearch Code.....195864 **$1995**

Upgrade
Websearch Code.....195865 **$649**

AutoCAD 2004

Faster Data Creation, Easier Data Sharing

In any industry that requires technical drawings, speed and efficient use of data are critical to the success of design projects. This is where AutoCAD® 2004 software can help. It provides new productivity tools, an improved user interface, and presentation graphics for faster data creation. It offers password protection, CAD standards tools, and support for multisheet DWF™ (Design Web Format™) files for easier data sharing. It also provides new network licensing and software inventory tools for more efficient license tracking and management.



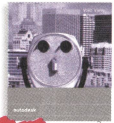
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Volo View 3

This easy-to-learn and easy-to-use viewer transforms the paper-based design review process into an efficient electronic one that quickly gets the information to everyone who needs it - including those without access to the originating software such as AutoCAD or Autodesk Inventor. Familiarity with the originating design application is not necessary. Mark up drawings and then save them to a DWF (Design Web Format) file, without changing the originals.

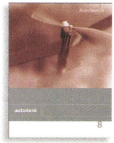


NEW

$97
Websearch Code.....197265

AutoSketch 8

An affordable and easy-to-use precision drawing tool for new or occasional CAD users who need to create conceptual drawings and sketches. It provides productivity and ease of use features not found in other low cost precision drawing programs. From concept sketches, information graphics and floor layouts to presentations, electrical drawings and home project plans, you can draw it all - quickly and accurately.



$229
Websearch Code.....189580

QuickCAD 8

QuickCad is the most affordable design program that Autodesk offers, but its low price doesn't diminish its capabilities. It comes with plenty of productivity features that let you make technical designs and diagrams. With its short learning curve, QuickCAD lets you start drawing right away by offering a simple beginner interface, then as you grow familiar with its capabilities, you can change to advanced or expert levels.



$139
Websearch Code.....188591

Manufacturing Design Solution

- Autodesk Inventor
- Autodesk Mechanical Desktop
- AutoCAD Mechanical
- AutoCAD (included as part of AutoCAD Mechanical)



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Websearch Code.....198670

Building Design Solution

- Autodesk Revit
- Autodesk Architectural Desktop
- Autodesk VIZ
- AutoCAD (included as part of Autodesk Architectural Desktop)



Student Versions

$269
Websearch Code.....198671

Land and Civil Design Solution

- Autodesk Land Desktop
- Autodesk Survey
- Autodesk Civil
- AutoCAD (included as part of Autodesk Land Desktop)



Student Versions

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Websearch Code.....198672

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Macromedia Studio MX PLUS

The essential suite of tools for building websites and rich Internet applications Includes Macromedia Flash MX, Dreamweaver MX, Fireworks MX, FreeHand MX, ColdFusion MX Developers Edition, Flash Player 6, DevNet Resource Kit Special Edition and Contribute.

- Academic $289
- Upgrade from 2 products $879
- Upgrade from 1 product $1199

Full
Websearch WIN 185238 **$1599**



Macromedia DevNet

DevNet Subscriptions gives you the latest development software, Macromedia servers and productivity-enhancing resources, conveniently delivered online and on CD and all for a single annual fee.

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Essentials
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Centennial Media provides the solution through interactive CD computer training of the highest standard that is also convenient, flexible and extremely cost-effective.



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FireWorks MX
$297
Websearch Code 195824

Flash MX
$297
Websearch Code 195822



Macromedia Dreamweaver MX

Create, build, and manage websites and Internet applications. The combination of its renowned visual layout tools with the rapid web application development features of Dreamweaver UltraDev and the extensive code-editing support of Macromedia HomeSite.

- Academic $199
- Upgrade $379

Full
Websearch WIN 192217 **$749**
Websearch MAC 192274



Macromedia Freehand MX

Concept and design visually-rich graphics for print and web with Macromedia FreeHand MX, the multi-publishing design solution with powerful illustration and drawing tools and an open, streamlined workflow.

- Upgrade from 10 $199

Full
Websearch WIN 195301 **$729**
Websearch MAC 195300



Macromedia Flash MX

Macromedia Flash MX provides everything you need to create and deliver rich Web content and powerful applications. Whether you are designing motion graphics or building data-driven applications, Flash MX has the tools you need to produce great results and deliver the best user experiences across multiple platforms and devices.

- Academic $199
- Upgrade $379

Full
Websearch WIN 188819 **$899**
Websearch MAC 188820



Flash MX Communication Server Pro 1.5

Develop the next generation of online communications, deliver multi-way audio, video, and real-time data in your websites and Rich Internet applications. Change the way we communicate and collaborate online. Create engaging presales applications that integrate audio, video, text, chat, and enterprise data.

- Upgrade $179

Full
Websearch WIN 196726 **$799**



Macromedia Director MX

Combine any media, deliver anywhere, and reach everyone with Director MX, the powerful multimedia-authoring solution. With Director, you can build rich accessible content that delivers real results, integrating interactive audio, video, bitmaps, vectors, text, fonts, and more. Work more effectively within the familiar Macromedia MX user interface and take advantage of unprecedented Macromedia Flash MX integration. Customize your applications with an extensible plug-in architecture and ensure smooth playback—even when using long files or videos—with advanced memory management. And deploy on CD/DVD, corporate intranets, or to over 300 million web users with Shockwave Player.

Upgrade from 8
Websearch WIN 194211 **$799**
Websearch MAC 194212

Full
Websearch WIN 193893 **$2199**
Websearch MAC 193894



Macromedia ColdFusion MX

Easily build rich Internet applications that integrate with databases, XML, web services, Macromedia Flash, and more. ColdFusion MX empowers developers with a productive scripting environment and integrated search and charting capabilities. Deploy on industry-standard operating systems and harness the power of the Java and .NET platforms with the legendary ease of use of ColdFusion.

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Server Professional plus two year subscription $2749

Server Enterprice
Websearch Code 190326 **$7499**

Server Professional
Websearch Code 193277 **$1949**



Macromedia Contribute

Now anyone can update, add and publish content to existing websites without knowing HTML. With Macromedia Contribute non-technical users can update any HTML website including sites built in Dreamweaver, FrontPage, and other tools, without affecting the quality of existing HTML code. For web professionals, this means spending less time on content maintenance while retaining control over website style, layout, permissions, and code. Contribute is a stand alone product that also works seamlessly with Dreamweaver MX and supports Dreamweaver templates, so web professionals can quickly integrate Contribute into their existing workflow.

Academic
Websearch WIN 197407 **$169**

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Websearch WIN 192407 **$189**

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$119
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City Software Acquires eStore!

City Software's radical growth has necessitated a physical retail presence in Sydney and we have the pleasure to announce that we have acquired the assets of eStore and its website www.estore.com.au. City Software has been steadily growing, both organically and by aquistion over the past decade - setting the standard in reliability, speed and price and this aquistion shall only add to the benefits and level of service that we can offer you!

All The Benefits Of eStore...Plus More!!!

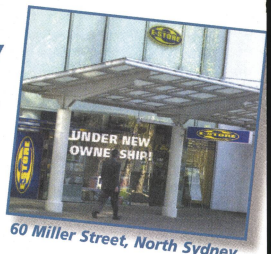
- Australia's most experienced IT "express courier delivery" company (since 1991).
- Fast and reliable shipment of orders, dispatching over 80% of all orders same day.
- Greater buying power and product range means lower prices.
- Well educated customer service staff ready to answer your questions in our 30-line call centre.
- Financial stability and proven track record in acquiring an IT company.

eStore: Australia's Largest Online Computer Superstore.

eStore will remain a major player in the online computer retail market, offering a HUGE range of products at Australia's most competitive prices, all backed by City Software's robust systems and distribution 'muscle', guaranteeing fast reliable delivery and fantastic customer service all at the best prices!

Retail Shop & Order Pickup Point: North Sydney

Open 8.30am to 6.00pm Monday to Friday, we now have a new store at 60 Miller Street, North Sydney. You will find the store stocked with a large range of software, hardware and consumable products. If you wish, you can also organise to pickup your orders from this central Sydney location.



60 Miller Street, North Sydney

Order Online Today!

So please visit us at any one of our sites: you will find an exceptional range of hardware, software and consumables at Australia's lowest prices!



* Limit 1 per customer. While stocks last.

$2 with any purchase from our NEW Sydney store!

Imation CD-R 80min 700mb 48x 10 Pack & Bonus Mini CD

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